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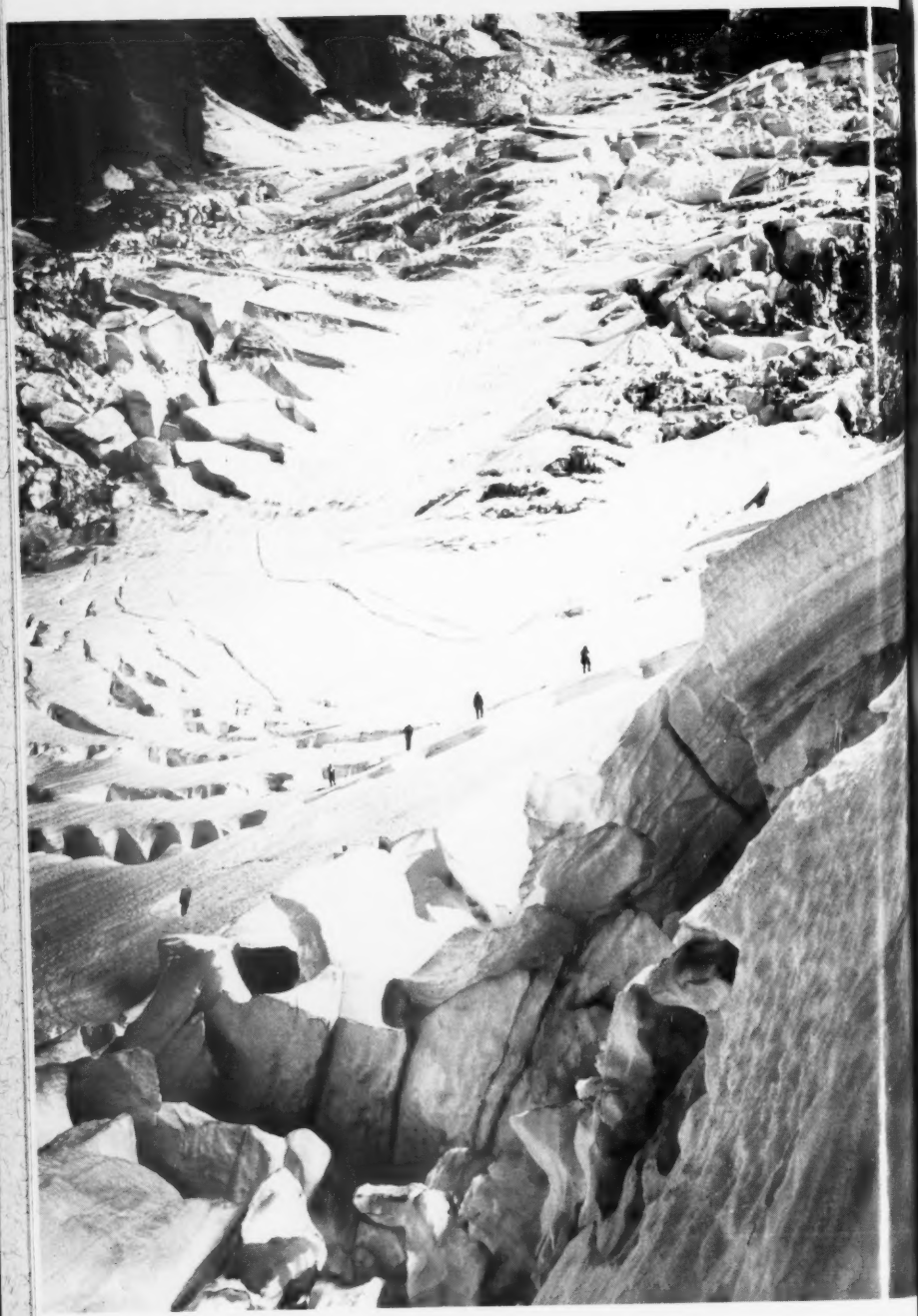


MOUNT RAINIER—MOWICH GLACIER. *By Bob and Ira Spring*

The Climbing History of Mount Rainier

DEE MOLENAAR

The view we enjoyed from the summit could hardly be surpassed in sublimity and grandeur; but one feels far from home so high in the sky, so much so that one is inclined to guess that, apart from the acquisition of knowledge and the exhilaration of climbing, more pleasure is to be found at the foot of the mountains than at their frozen tops. Doubly happy, however, is the man to whom lofty mountain-tops are within reach, for the lights that shine there illumine all that lies below.

— John Muir

Lieutenant Kautz's Climb

One hundred years ago, on July 15, 1857, Lieutenant August Valentine Kautz stood wearily gazing about him at the rolling expanse of a glacier high on Mount Rainier. His reddened eyes smarted under long exposure to the glaring white world surrounding him, and his sunburned and bearded face showed deeply the lines of fatigue and hunger. Some distance below, two companions gasped for breath and struggled with an occasional step upward. It was 5 o'clock and already shadows were creeping across the ridges and giving outline to the windswept undulations of the snowfield's surface. The strong breeze that had been blowing most of the day, with accompanying freezing temperatures, was already causing the formation of ice crystals in the men's canteens and the weather gave signs of deterioration as clouds began to form and sweep across the ridges above. From one of the figures below, a soldier named Dogue, came the strongly German-ascented, "I guess, Lieutenant, we petter go pack."

Kautz took another deep breath and looked above him, then below, at the gradually darkening forests and ridges which lay below the vast sweep of the mountain's south flanks. A chill breeze suddenly took his cap from his head and carried it beyond reach; soon the numbing sensation in his toes and fingers worked into his consciousness as he realized the wisdom of his companion's advice, and of the hopelessness of proceeding farther under the present conditions at such a late hour. Already the party had in ten hours climbed between six and seven thousand feet above the last camp located far below in the green meadow above the west moraine of the Nisqually Glacier. Two members of the party, a soldier named Carroll and the Indian guide Wapowety, had already given up owing to fatigue and snowblindness and had returned to camp. Dogue and Dr. Robert Orr

Craig had trailed the lieutenant to the present point, where, in Kautz's own words, ". . . although there were points higher yet, the mountain spread out comparatively flat."

With one last glance upward to the snow-ridge crest piercing the rapidly clouding sky, Kautz rejoined his companions and at 6 o'clock they began the descent the way they had come up, back down the pinnacles and terraces of a roughly broken portion of the glacier below and over the steep snowfields and rocky ridges leading to their camp near timberline. Weary to the point of exhaustion and weak from an indequate diet over the past few days, scratched and battered by a week of fighting the heavy underbrush, dense forests, and stream crossings of the 140-mile approach march from Fort Steilacoom on the Puget Sound, Lieutenant Kautz and his four companions had accomplished the first clearly recorded attempted ascent of Mount Rainier. To them must go the credit for disproving the belief so prevalent in those days regarding the impossibility of such an ascent. Indeed, to Lieutenant Kautz we must also give credit for a foresight of things to follow:

> *When the locomotive is heard in the region someday, when American enterprize has established an ice cream salon at the foot of the glacier, and sherry cobblers may be had at twenty-five cents halfway up to the top of the mountain, attempts to ascend that magnificent peak will be quite frequent. But many a long year will pass away before roads are sufficiently good to induce any one to do what we did in the summer of 1857.*

As an aftermath to this expedition, which ended when the climbers returned to Fort Steilacoom, emaciated and hardly recognizable to post personnel: Wapowety nearly died, Dr. Craig was ill for many days, and the two soldiers spent several months under medical care, after which one applied for a discharge pension on the grounds of permanent injuries suffered. Lieutenant Kautz, however, suffered no lasting ill effects from the ordeal. Today the Kautz Glacier is named in honor of the courageous officer who first trod its upper elevations; Wapowety Cleaver, the ridge up which they climbed above their highest camp, is named after the old Indian guide who had followed Kautz upward in the face of tribal legends which admonished against such an undertaking.

[A. V. Kautz, "Ascent of Mount Rainier," *Overland Monthly*, May 1875, vol. 14. (Reprinted in Meany); Edmond S. Meany, *Mount Rainier: A Record of Exploration*, New York, 1916 (cited hereinafter as *Meany*); Joseph T. Hazard, *Snow Sentinels of the Pacific Northwest*, Seattle, 1932 (cited hereinafter as *Hazard*); Caroline Leona Talbert, *History of Mount Rainier National Park*.]

In retrospect on Kautz's achievement some conjecture has arisen regarding the highest point attained by the pioneer climber. His own words describing the summit area would indicate that he was not far below the 14,000-foot elevation, either near the top of Wapowety Cleaver or Point Success, from which points the summit does flatten out toward the highest peak on the crater rim. It is improbable that complete agreement will ever be reached in this regard by students of the Kautz attempt.

The first complete ascent of the Kautz Glacier route was made July 26-28, 1920, by the Swiss brothers, Hans and Heinie Fuhrer, Park Superintendent Roger W. Toll, and Harry M. Myers. These men began their climb from Christine Falls on the Longmire-Paradise Highway, then worked their way up the ridge via Van Trump Park. They had little difficulty making a direct ascent over the Kautz Icefall and from here continued on to the summit. The descent was made by the Gibraltar Route. (C. Frank Brockman, *The Story of Mount Rainier National Park, 1946;* oral communication with Hans Fuhrer, December 23, 1956.)

In 1921, Joseph T. Hazard, O. B. Sperlin, Wallace Burr, and Stella Shahan followed the exact route taken by Kautz from the edge of the Nisqually Glacier upward. Reconstructing Kautz's ascent as closely as possible they climbed the icefall with little difficulty and reached 12,000 feet before turning back, satisfied that by comparing Kautz's 10-hour climbing time with their own, Kautz had turned back at about this elevation. Three years later, on July 11-13, 1924, Joseph T. Hazard with twelve others again reconstructed the Kautz climb, this time completing the ascent to the summit after an early start from their high camp at 11,000 feet, below the ice cliff. On this ascent, however, the hitherto easily climbed cliff proved impassable and the party was forced to contour westward below the cliffs to make the climb via the ice chute. The descent was made exciting by several rappels down the ice cliff. (*The Mountaineer,* 1924, vol. 17.)

Subsequent climbs of the Kautz Route have proved the ever-changing character of the ice cliffs; during the 1939-1947 seasons, guides had little difficulty leading their parties directly over the cliff, while all climbs since 1948 have had to ascend via the chute, the cliff itself forming a 35- to 50-foot vertical barrier.

Reported Pre-Kautz Ascents of Rainier

Although Kautz's attempt to climb Mount Rainier was the first one to be widely reported, several recently substantiated sources of information have presented accounts of climbs made prior to 1857. Aubrey L. Haines,

former District Ranger at Paradise Valley and now Assistant Park Engineer at Yellowstone National Park, has done considerable research in connection with a proposed publication on the very early (pre-1900) history of Mount Rainier and has generously supplied the following data:

> 1852, Aug. 21: Sidney S. Ford, Jr., Robert S. Bailey, John Edgar, Benjamin Franklin Shaw. Approach by Nisqually Valley and ascent up south side of mountain to what was then considered "the top," probably about 14,000'. At least one overnight camp was made. Unfortunately the principal account suffers from being presented by the editor of an early newspaper, but other scattered references fill out the details fairly well. (*The Columbian,* Olympia, W. T., Sept. 18, 1852; several other newspapers; Bancroft's *History of Washington; Steel Points,* Portland, Oregon, July 1907, p. 199.)
>
> 1854 (?), June: Two men, names unknown, engaged in the survey of the treaty boundary of the Yakima Indian Reservation, approached by the Tieton drainage to the summit of the Cascades at Fish Lake; thence, north to Yakima Park and an encampment at Mystic Lake. They were guided by a young Yakima Indian named Shu-lu-skin (not the Sluiskin who guided Stevens and Van Trump). The ascent was made by the white men alone, by way of the Winthrop-Emmons route, to the summit crater, where they left a cairn. The description of the crater leaves no doubt that they reached it. (A. J. Splawn, *Ka-mi-akin, the Last Hero of the Yakimas,* 1917; L. V. McWhorter, "Chief Sluiskin's True Narrative," *Washington Historical Quarterly,* January 1917.)

The Ascent of Mount Rainier In 1870

In early August of 1870, 13 years after Lieutenant Kautz's valiant effort, three men, General Hazard Stevens, Philomen Beecher Van Trump, and Edmund T. Coleman, met in Olympia, Capital of Washington Territory, for the purpose of planning an attempt to be the first to stand upon the mountain's highest summit. These were uncommon men of great accomplishment and determination. General Stevens was the son of the first governor of the Territory, Isaac Stevens. Young Stevens, at the age of 23 was a brigadier general of volunteers, next to youngest in the Civil War. At the time of his attempt on Rainier, he was surveyor-general of Washington, 28 years of age, an extremely capable and rugged outdoorsman. P. B. Van Trump was another stalwart pioneer of the Rainier area. After his ascent in 1870 he was to climb the mountain by various routes until he reached a graceful old age. He served for many years as a ranger at Indian Henry's Hunting Ground and from that location led many ascents of the west side routes on the mountain. Stevens and Van Trump remained close friends throughout life and are both today well honored by place names within the National Park. (Hazard Stevens, "The Ascent of Mount Takhoma," *Atlantic Monthly,* November 1876; *Meany; Hazard.*)

Edmund T. Coleman was an unusual man in many ways. An English artist who had exhibited in the Royal Academy on several occasions, he had an adventurous nature and curiosity for new lands. In 1862, at the age of 39, Coleman arrived in Victoria, British Columbia. Forthwith he

began exploring the wild mountain region of Washington Territory, making voyages far up the Skagit and Nooksack rivers and, after several determined attempts, he succeeded in making the first ascent of Mount Baker, in 1868, at the age of 45. Coleman was an early advocate of the sport of mountaineering in a rugged new country in which such pursuit was generally considered foolhardy or unnecessary. In fact, Sluiskin the Indian guide who accompanied the trio to timberline on Rainier, joked of Coleman: "White men in Victoria have good sense—everybody look out of window while King George man talk mountain top!" It was paradoxically Coleman's early experiences in the Alps that indirectly resulted in his failure to keep pace with the two younger men on the Rainier ascent; aside from being older than his companions, he was carrying far too many items of equipment which he considered to be essential to success on the peak. In the end his heavy load held him back before the ascent had fairly begun.

On August 8 the three men began their march toward the mountain. That evening they arrived at the ranch of James Longmire at Yelm Prairie. A gay entourage of young men and women accompanied them this far to bid them good luck on their proposed undertaking. The next morning the three men were able to enlist the services of Mr. Longmire and his pack horses in guiding them to the base of the mountain. Several days later the party had pushed its way through the heavy forests and across rivers and had reached Bear Prairie, about a mile south of the present location of the Park headquarters at Longmire and on the divide between the Nisqually and Cowlitz rivers. Here Longmire's duties were ended, as he procured for the climbers the services of the Yakima Indian, Sluiskin, who was to guide the party to timberline.

From the vicinity of the climbers' camp at Bear Prairie it would have been fairly simple to ascend toward timberline via the Nisqually canyon, following the route used by Kautz in 1857. However, the climbers were either unaware of this approach or were dissuaded by Sluiskin's arguments for an approach along the crest of the Tatoosh Range, which rose above their campsite. It may have been a result of the Indian's desire to keep the whites away from a favored hunting ground, or perhaps a desire to prolong the length of his service, but the next day the party began the climb of the steep cliffs of Eagle Peak. Soon Coleman began dropping behind with his heavy pack and he found that the cliff up which he had ventured would permit him neither further ascent nor descent with the cumbersome load. He took the pack from his shoulders and, in attempting to drop it to a lower ledge, watched it bound out of sight into the brushy

depths below. Dismayed, he carefully lowered himself and sought in vain for the lost pack. With the others soon beyond shouting distance, Coleman returned to camp to decide upon his next course of action.

In the meantime Sluiskin led his two eager young companions to the crest of the ridge where they paused to wait for Coleman who was carrying the bacon supply for the expedition. Sluiskin's efforts to locate Coleman soon led the two men to believe Coleman had given up the ascent. Evening found the climbers encamped in a sheltered meadow two miles farther along the ridge crest. At dawn the next morning they continued the traverse of the ridge, the Indian leading them on a winding course, almost in an apparent attempt to tire and discourage his companions from climbing higher on the mountain of which he held a native dread. Finally the party reached a break in the ridge crest which allowed them their first close-up view of the peak rising high above the deep intervening valley. The two white men were awe-stricken by the magnificent panorama, but Sluiskin showed increasing dejection over the increasing ardor of his companions.

Descending to the vicinity of Reflection Lake and then ascending along the meadowed park-like Mazama Ridge, the party made camp that night in a small grove of firs. After partaking of a supper of grouse, felled by Sluiskin's rifle, the men reclined in the light of their fire and discussed the plans for the next morning. It was now apparent to the Indian that the white men were seriously contemplating the ascent of the mountain and he began a solemn exhortation in broken English and Chinook, warning them against such a rash undertaking. He described the evil spirit that inhabited "Takhoma" and dwelled in the fiery lake on its summit, and the many certain dangers of the ascent over cliffs of crumbling rock and ice; many years ago his grandfather, a great chief and warrior, had ascended part way up the mountain and had encountered some of these dangers, but had fortunately turned back in time to escape destruction and the vengeance of the demons of the mountain top; and no other Indian had ever gone that far.

Finding that his words had no effect on his companions, Sluiskin pleaded with them to give him a note to the effect that they had made the climb against his wishes; he would wait for them three days, and would return to Olympia to show the note to their friends as evidence of their fate. The night ended with a long and dismal chant by the Indian.

The next morning the party moved the camp farther up the ridge on a high knoll overlooking the cascades of a turbulent waterfall, which they named in honor of the Indian who led them this far. Here they attached

snow spikes to their boots and with alpine staff in hand went up the ridge to reconnoiter the best line of ascent. After climbing the easy slopes of snow and rock for four hours they reached the approximate point of the present day Camp Muir at 10,000 feet elevation. After scanning the steep slopes above and deciding on a long rocky spur as their best line of ascent for the next day, they returned to their timberline camp.

Early the next morning, August 17, 1870, Stevens and Van Trump began the final ascent. Besides their alpine staffs and creepers, they carried a long rope, an ice axe, a brass plate inscribed with their names, their flags, a large canteen and some luncheon, gloves and green goggles. Certain that they would reach the summit and return in one day they left behind their blankets and coats. Climbing more rapidly than on their previous day's reconnaissance they reached the foot of the rock ridge in three hours and began the ascent along the jagged crest of this ridge. Toiling up this irregular backbone, first on one side then along the other, but keeping on the crest as much as possible to avoid the crumbling rock slides on each side, they reached the notch at the base of Gibraltar Rock in two hours. Here they gained a narrow ledge running along the south face of the huge rock and crept along this, hugging the rock face as much as possible. On the left it fell off nearly sheer in a series of basalt ledges to the glacier 2000 feet below. The looseness of the rock along the ledge demanded great care in their movements and several times they knocked rocks off which bounded into the abyss below. Moreover, rocks fell from above, but fortunately none struck the climbers. Five hundred feet of this progress brought the two men to the upper end of the ledge, where it joined the snowfield that descended from the summit dome of the mountain. By bringing their ice axe into play, chopping steps up the steep lower portions of the chute which joined rock and ice, the climbers emerged onto the ever-flattening level of the upper glacier. Here they found the surface deeply pitted and corrugated with deep depressions alternating with sharp pinnacles two and three feet high, the "suncups" of later descriptions. Up this staircase they ascended rapidly as the mountain slope lessened. Assuming that the highest point of the mountain rose on the left (southwest) side of the summit dome, they traversed gradually in that direction. Several large crevasses barred their way, one of which was crossed by roping a pinnacle on its upper side and climbing up the rope. As they climbed higher into the rarefied air they were forced to pause frequently, every 70 to 80 steps, in order to catch their breath. At 5 o'clock in the afternoon, after eleven hours of climbing from camp, they reached the crest of the ridge and planted their flag against the furious blast of wind that swept

the summit area. As they looked about they noticed that a higher summit lay to the northeast of their present high point which they had named Peak Success (later named Point Success). Realizing that the late hour would not allow them time for the descent that same day and feeling the full force of the wind, nevertheless they crossed the intervening depression toward the highest point of the summit. Climbing over a rocky ridge below the summit they found themselves within a small circular crater about 200 yards across. Detecting the odor of sulphur and noting numerous jets of steam, they were overjoyed to find warmth so high on the peak. A deep cavern extending down the inner slope of the crater provided the two tired and cold climbers with relief from the winds. A relatively comfortable night was spent here, with steam heat warming one side, while the frigid air chilled the other side of their inadequately covered bodies.

Dawn broke slowly, dull and gray, and a howling wind and blowing mist greeted the climbers as they emerged from their crude refuge. Noting a brief rift in the scurrying clouds, they made preparations for the descent. First, however, Stevens deposited the brass plate containing their names in a cleft of a large boulder near the highest summit and left alongside their empty canteen covered by a large stone. After this was done the two climbers passed around the summit, which they named Crater Peak, and noticed for the first time the existence to the east of a larger, more perfectly formed crater. After briefly examining this depression and, through the driving mist noticing another peak to the northwest which they named Peak Takhoma (later called North Peak, then Liberty Cap), the two miserable and benumbed men began the descent the way they had come up. At 1:30 P.M., four hours after leaving the crater, they reached the lower end of the rocky spur where the climbing difficulties were ended. From here they struck out joyfully for camp. When nearly there Van Trump slipped and plunged down a steep snowbank striking loose rocks below, which resulted in deep abrasions of face and hands and a deep gash in his thigh. The camp was nearby, however, and the two men reached it shortly thereafter. A few minutes later they observed Sluiskin slowly approaching camp, his head down. As he raised his head and gazed long and fixedly at the two men whom he had long given up for lost, he gradually ascertained that they were alive and not spirits come to haunt him. He hurried forward and embraced the two white men with cries of "Skookum tillicum! Skookum tumtum!" ("Strong men! Brave hearts!")

The next morning the three men descended toward Reflection Lake, where Van Trump's injuries required that he remain while Stevens and

Sluiskin returned to Bear Prairie, this time via the shorter route of the Paradise and Nisqually valleys, which they covered in six hours. Although Sluiskin still showed an aversion to this route, his skillful guiding down the river valley indicated to Stevens that the Indian was familiar with the terrain. Upon arriving at Bear Prairie they found Coleman glad to see them and rejoiceful of their success. He, in the meantime, had been busy carrying two loads of supplies to the top of Eagle Peak and was at the moment preparing some cricketer's spikes for an attempt to make the ascent himself. The following day Sluiskin returned part way up the valley with a pony and succeeded in bringing Van Trump back to camp that evening.

A few days later, according to Stevens' own words:

As the last rays of the sun, one warm, drowsy summer afternoon, were falling aslant the shady streets of Olympia, Mr. Longmire's well-worn family carry-all, drawn by two fat, grass-fed horses, came rattling down the main street at a most unusual pace for them; two bright flags attached to Alpine staffs, one projecting from each door, fluttered gayly overhead, while the occupants of the carriage looked eagerly forth to catch the first glimpse of welcoming friends. We returned after our tramp of two hundred and forty miles with visages tanned and sunscorched, and with forms as lean and gaunt as greyhounds, and were received and lionized to the full, like veterans returning from an arduous and glorious campaign. For days afterward, in walking along the smooth and level pavements, we felt a strong impulse to step high, as though still striding over the innumerable fallen logs and boughs of the forest, and for weeks our appetites were the source of astonishment to our friends and somewhat mortifying to ourselves. More than two months had elapsed before Mr. Van Trump fully recovered from his hurts. We published at the time short newspaper accounts of the ascent, and, although an occasional old Puget Sounder will still growl, "They say they went on top of Mount Rainier, but I'd like to see them prove it," we were justly regarded as the first, and I believe the only ones up to the present time, who have ever achieved the summit of Takhoma.

Subsequent History of The Gibraltar Route

Following the widely publicized ascent of the Gibraltar Route by Stevens and Van Trump in 1870 came many years of popular use of this line of ascent. Two months after the pioneer climb, on October 17.

1870, Samuel Franklin Emmons and A. D. Wilson, noted geologists, made the second ascent of the mountain, via the Gibraltar ledges. After obtaining helpful information from General Stevens in Olympia they headed toward the mountain, with James Longmire again leading the way to Bear Prairie. Heavily burdened with scientific equipment with which they hoped to lay out a base line for future topographic mapping of the peak, they were unable to use the approach by Sluiskin Falls, so they circled the foothills to the eastward and went up the Cowlitz Divide. From a base camp at Cowlitz Park they spent several days surveying their proposed base line, after which they climbed the Gibraltar Route to the summit by a crossing of the Cowlitz Glacier. Owing to high winds and clouds on the summit they were unable to make the desired scientific observations. Their return to civilization was made by a circuitous crossing of the Cascades eastward to Fort Simcoe, from which they journeyed to The Dalles on the Columbia River. *(Journal of the American Geographical Society, 1879.)*

So many ascents of the peak prior to 1900 have been recorded that only those of particular interest are listed below. Present sources of information indicate that well over 100 people, in over 30 parties, climbed the mountain before the turn of the century; after that the climb became so common as to relieve the burden of further accurate count for historical purposes.

1883, Aug. 16-17: P. B. Van Trump, George B. Bayley, James Longmire. On the return journey Longmire discovered the warm mineral springs near which he later constructed the first permanent settlement in the area now included in the national park. (*Overland Monthly,* September 1886; Seattle *Post Intelligencer,* Aug. 12, 1894.)

1888, Aug. 11: P. B. Van Trump, E. S. Ingraham, John Muir, A. C. Warner (who made the first photographs of the summit), Charles V. Piper, D. W. Bass, Norman O. Booth. (William Keith, artist, and Henry Loomis did not complete the ascent.) High camp, originally called "Cloud Camp," named by Ingraham "Camp Muir": "Upon reaching that point in the ascent, Mr. Muir suggested it as a good place to spend the night, saying that the presence of pumice in large quantities indicated the absence of wind." (*The Mountaineer,* 1909, vol. 2; John Muir, *Steep Trails; Meany.*)

1890, Aug. 10-11: First ascent by a woman. Party included Rev. E. C. Smith, Len Longmire, W. O. Amsden, R. R. Parrish, and Miss Fay Fuller.* In correspondence with Mrs. Fritz von Briesen (Fay Fuller)

* Miss Fuller was an original member of A.A.C. (*AAJ*, 1946, 6:1.)

in 1933, Park Naturalist C. Frank Brockman received the following description: "The costume . . . will amuse present-day climbers. I had it made at the time when bloomers were unknown and it was considered quite immodest. How anyone could have scrambled over the rocks thus attired is now inconceivable. There were no boots or heavy shoes available for women at the time and I bought the strongest shoes that were sold to boys." (The alpenstock was made by a blacksmith at Yelm from a curved shovel-handle.) According to Len Longmire's account of the climb, Miss Fuller refused assistance from the men at difficult spots and stated that if she could not achieve the goal without their help she would not deserve to reach it. *(Brockman.)*

1890, Aug. 11-13: Solomon C. Hitchcock, Arthur F. Knight, F. S. ("Van") Watson, Will Hitchcock. (Reference: Aubrey L. Haines.) In August 1954 guide Jim Whittaker found a record of this climb inscribed on a rock at the crater rim.

1891, July 29-31: Second ascent by women—Susan Longmire (age 13), Edith Corbett (schoolteacher, of Yelm) — with Len Longmire and others. (*Brockman.*)

1894, July 18-19: E. S. Ingraham led party of 14, including 3 women. The party was stormed-in at the summit for 26 hours. The name "Columbia Crest" (originally "Columbia's Crest") was given to highest point on the crater rim. According to their barometric readings it was 15,550 feet above sea level, "the highest point in the United States, exclusive of Alaska." (Complete coverage, including pen sketches, in Seattle *Post Intelligencer,* Aug. 12, 1894.)

1897, July 27: A large party of the Mazama Club, of Portland, made the ascent, several voluntarily staying all night in the crater. Professor Edgar McClure, University of Oregon, made barometric observations from which the altitude was subsequently computed by a colleague to be 14,528 feet. During the descent toward Paradise Valley, after dark, McClure was killed by a fall from a rock which now bears his name. (*Mazama,* 1900, 2:1; Seattle *Post Intelligencer,* Nov. 7, 1897, reprinted in *Meany.*)

1905, July: Joint outing of the Sierra Club of California and the Mazama Club, with members of the Appalachian Mountain Club participating, on which 112 made the ascent. General Hazard Stevens made the ascent for the second time, at the age of 63. Among those who participated in the climb, or at campfires, were: Henry Landes (State Geologist of Washington), W. D. Lyman (Whitman College), Stephen T. Mather (later the Director of the National Park Service); and the

following members of the American Alpine Club: Professor Charles E. Fay (then President of the Club, who went as far as Gibraltar), Professor Joseph N. LeConte, Edward T. Parsons, Charles H. Sholes, Claude E. Rusk; and the following who later became members of A.A.C.: William E. Colby, James S. Hutchinson, Edward W. Harnden, Asahel Curtis, John H. Cameron, Rodney L. Glisan, Marion Randall (later Mrs. Edward T. Parsons). (*Mazama,* 1905, 2:4; *Sierra Club Bulletin,* 1906, 6:1; *Appalachia,* May 1906, 11:2.)

1913: The U.S. Geological Survey completed its measurements and triangulations, begun in 1910. Two climbs were made from Camp Muir during the 1913 survey. Storms forced a bivouac in the crater on August 16. Final measurments were made August 20 by C. H. Birdseye, W. O. Tufts, O. G. Taylor, S. E. Taylor. The altitude was officially determined to be 14,408 feet. (François E. Matthes: *Sierra Club Bulletin,* 1914, 9:3; *The Mountaineer,* 1915, vol. 8.)

The Geological Survey's Bulletin *little more than hints at the fortitude and pluck of Mr. Birdseye and his party in their almost disastrous experiences on the peak. Survey men are so frequently confronted by peril in their daily work, that they are not apt to write or talk about it, and as a consequence the public seldom learns the intimate details. It is to be hoped that the history of this undertaking will some day appear in full.—Matthes,* S.C.B., *1914.*

It is a tribute to the skill and accuracy of the surveyors of 1913 that when another survey was made, in 1956, by the U.S. Geological Survey in collaboration with the National Park Service, with improved facilities, only two feet were added to the earlier computation. On the latter occasion the surveyors, Charles R. Lloyd, Toivo J. Nelson, William Kirschner, were carried by helicopter to the saddle between Point Success and Columbia Crest. The altitude of Mount Rainier above sea level is now officially stated by the Geological Survey to be 14,410 feet.

1916: A small stone shelter-cabin was constructed at Camp Muir.

1921: A large stone shelter-cabin was constructed at Camp Muir.

1921, Sept. 7: Edward L. Hamilton and Lenora Allain were married at the summit. The wedding party of 16 was led by Hans Fuhrer (guide, 1919-1925).

1922, Feb. 13: Charles Perryman, Jacques Bergues, Jean and Jacques Landy made winter ascent by Gibraltar Route, carrying to the top a heavy and cumbersome motion-picture camera with which the first movies were taken of a summit climb. (*The Mountaineer,* 1935, vol. 28; records and photos in National Park museum.)

1936-1937: During fall or winter the Gibraltar ledge trail slid away in huge rock-avalanche. As a result the Gibraltar Route was abandoned, ending a long period during which hundreds of tourist-climbers were guided by this route to the summit crater. From 1937 to 1949 parties, both guided and independent, used the Emmons-Winthrop Glacier Route, the Muir-Ingraham Route, and the Kautz Route.

1948, July 13: Cornelius ("K") Molenaar and George R. Senner, seasonal rangers at Paradise Valley, reopened the Gibraltar Route by dropping to a lower ledge and regaining the original ledge and chute higher up. The Gibraltar Route has again become the one most frequently used, notwithstanding the constant menace of falling rocks.

Emmons-Winthrop Glacier Route

The northeast flank of Mount Rainier is virtually blanketed by the vast expanse of the combined ice streams of the Emmons and Winthrop glaciers. The former is the largest glacier in the United States (exclusive of Alaska). It extends from the crater rim in an unbroken sweep of 6 to 7 miles into the deeply cut valley of White River, far below timberline. Dividing these two large glaciers at the 9500-foot elevation is the wedge-shaped cleaver called Steamboat Prow. Emmons Glacier is bordered on the south by Little Tahoma, and Winthrop Glacier on the north by Curtis Ridge.

The ascent of this side of the mountain is today usually made by way of White River valley, with the first day's climb to high camp near the top of Steamboat Prow, via Glacier Basin and Inter Glacier on the back slope of the Prow. Thence the climb to the crater rim is made directly above the Prow along the indefinable border of Emmons and Winthrop glaciers. Although the climb is a long one, beginning at the 4500-foot elevation of the White River campground, it involves only the normal problems of route-finding on crevassed slopes. The ascent by this route has long been preferred by the larger parties composed of less experienced climbers. Parties of 40 to 60 climbers have become frequent now that outdoor clubs are initiating neophyte mountaineers into the art of high altitude climbing on snow and glacier.

Although, as already mentioned, an ascent may have been made by the Emmons-Winthrop Glacier about 1854, the first well-substantiated ascent by this route was not made until August 20, 1884, by three men from Snohomish—Rev. J. Warner Fobes, George Jones, and Richard O. Wells. Entering the present national park near its northwest corner, these pioneers, after a circuitous exploratory trip by way of Spray Park, lower

Carbon Glacier, and Moraine Park, made the ascent by an upward traverse of Winthrop Glacier to Steamboat Prow, thence up the Emmons-Winthrop divide to the crater. ("Three Snohomish Gentlemen Make a Successful Ascent," edited by Aubrey L. Haines, *The Mountaineer,* 1954, vol. 47; also, *The West Shore,* September 1885, 11:9; and the Snohomish *Eye,* Sept. 6, 1884.)

Subsequent Noteworthy Ascents of Emmons-Winthrop Glacier Route

1886, 1887: Two attempts by E. S. Ingraham and parties turned back by crevasses at about 13,000 feet.

1896, July 24: U.S. Geological Survey party of Israel C. Russell, Bailey Willis, George Otis Smith, with F. H. Ainsworth and William B. Williams, followed much the same route, around the north side of the mountain and up the glacier, as that of the 1884 party. After a night in the summit crater they descended to Paradise Valley by the Gibraltar Route, making the first traverse of the mountain from north to south. *(18th Annual Report of the U.S. Geological Survey, for 1896-1897; Scribner's Magazine,* August 1896; *Meany.)*

1909, July 30-31: Sixty-two members of The Mountaineers, Seattle, made the ascent via Moraine Park and Steamboat Prow. (Asahel Curtis, "Mountaineers' Outing to Mount Rainier," *The Mountaineer,* 1909, vol. 2.)

Skis on the Emmons-Winthrop Glacier Route

1927, April 30: Ski ascent to 12,500 feet—W. J. Maxwell, A. W. Anderson, E. Lester LaVelle. (*The Mountaineer,* 1927, vol. 20.)

1928, April 7: Partial ski ascent—Walter Best, Hans Otto Giese, Dr. Otto Strizek.

1939, July 1: Sigurd Hall made first complete ski ascent, but icy conditions prevented complete ski descent. (*The Mountaineer,* 1939, vol. 32.)

1948, July 18: First complete ascent and descent on skis—Kermit Bengston, Dave Roberts, Cliff Schmidtke, Charles E. Welsh. (*The Mountaineer,* 1948, 39:14.)

1955: Second complete ski descent—Robert McCall, Marcel Schuster, of the Yakima Ski Club. (Oral communication to D.M.)

Ingraham Glacier

Ingraham Glacier is a long narrow ice stream flowing down the east slope of Rainier. Lower in its course it joins the Cowlitz Glacier and

flows southeastward. Ingraham Glacier is bounded on the south by the massive buttresses of Gibraltar and the Cathedral Rocks, and on the north by Disappointment Cleaver and Little Tahoma; which separate it from Emmons Glacier. Between Gibraltar and Disappointment Cleaver the glacier drops steeply and is here characterized by what in some years is a steep and smooth concave slope, easily ascended, while in other years this portion of the glacier is a jumbled maze of crevasses and séracs. The usual route of ascent of Ingraham Glacier is now made by way of Camp Muir, with access to the glacier gained by a high traverse of the upper Cowlitz Glacier and through any one of three notches in the Gibraltar-Cathedral Rocks ridge. In years when the upper Ingraham Glacier is heavily crevassed a variation of the route is made by crossing it at about 10,000 feet. The ascent to the crater is then completed by climbing either Disappointment Cleaver or Emmons Glacier beyond.

An interesting account of the presumed first ascent of Ingraham Glacier, in the fall of 1885 or 1886, is given in *The Mountaineer* (1920, vol. 13) by Allison L. Brown. According to his story he was the only white man in a party of Yakima Indians engaged in a hunting trip along the Cowlitz Divide. Not finding any game, they sought diversion by embarking on a climb of the mountain. Using horses part way up the snowfields, they apparently ascended Whitman Glacier to the 8500-foot level, then crossed over to Ingraham Glacier at about the same notch that is used today on the ascent of Little Tahoma from Paradise. They then climbed alongside of Cathedral Rocks, up Ingraham Glacier. They did not reach the summit, and evidently treated the whole adventure lightly. The account mentions no problem of crevasses. Attempts either to refute or to substantiate this report have met with little success.

Tahoma Glacier

The view of Mount Rainier from the west shows more clearly than from any other direction the truncated appearance of the summit area. All three of the mountain's prominent high points are seen from this side only: Liberty Cap (14,112 feet), on the north, Columbia Crest (14,410 feet), in the middle, and Point Success (14,150 feet), on the south. Tumbling steeply down from Columbia Crest, and bordered on each side in its upper course by the north and south summits, Tahoma Glacier flows through a narrow gap in the summit dome and descends in a direct course for five miles—the most impressive ice stream on this side of the mountain. More than a mile in width in places, its surface is broken into numerous icefalls which alternate with comparatively smooth and open expanses of glacier. In its lower extremities the glacier separates, one lobe moving

southward to join the terminus of South Tahoma Glacier, the main body continuing into timberline below the 5000-foot level.

The first recorded ascent of Tahoma Glacier was made August 11-12, 1891, by P. B. Van Trump, Dr. Warren Riley, and Alfred Drewry. The climb was made from Indian Henry's Hunting Ground, a meadowland on the mountain's southwest slope. From here the men ascended part way up Success Cleaver, then crossed South Tahoma Glacier, at the 9000-foot level, to the Tahoma Cleaver, where camp was pitched for the night. Early the next morning they moved onto the main Tahoma Glacier and ascended up the center of the ice stream to the summit, where they inscribed their names on a lead plate which Van Trump had placed during his 1883 ascent of the Gibraltar Route with James Longmire and George B. Bayley. The descent was made via the Gibraltar Route, thus completing the first summit traverse of Mount Rainier. Although some earlier summaries do not list Alfred Drewry as a member of this party, recent research by Aubrey L. Haines has verified his participation in this ascent. (*The Mountaineer,* 1920, vol. 13; *Tacoma Ledger,* Aug. 26, 27, 31, 1891; *Olympia Tribune,* Aug. 26, 1891; *Washington Standard,* Sept. 18, 1891.)

Subsequent Ascents of Tahoma Glacier

1891, August 20: Second ascent, made a week after the first—Frank Taggert, Grant Lowe and Frank Lowe, of Orting, Washington. Although the exact route of their ascent is not described, there is evidence that they reached the summit from the west. (*Orting Oracle,* Sept., 1891; A. L. Haines.)

1892, July 30-31: Dr. Warren Riley, George Jones—during their ascent they also accomplished the first ascent of Liberty Cap (North Peak). (*Sierra Club Bulletin,* May 1894, 1:4; *Tacoma Ledger,* August 8 or 9, 1892; A. L. Haines.)

1892, August 21-22: P. B. Van Trump, George B. Bayley—climbed Liberty Cap the morning after a night in the crater. Van Trump describes their hope to be first on North Peak (Liberty Cap), only to find themselves beaten by Riley and Jones by three weeks. (*Sierra Club Bulletin,* May 1894, 1:4.)

1914, July 17: Joseph Stamphler, Winthrop T. Hovey, Roy Young, David Young, Roscoe Young. (*The Mountaineer,* 1920, vol. 13.)

1934, July 6: Hans Fuhrer and Alfred E. Roovers made ascent via Puyallup Cleaver; Tahoma Glacier ascended from 7000-foot level to summit. (*A.A.J.,* 1935.)

1935: Granville Jensen, Joe Halwax, Lavelle Cooper.

1936: J. Wendell Trosper and party.

1940: Lyman Boyer, Joseph Buswell, David Lind.

Since World War II Tahoma Glacier has become increasingly popular and has been ascended by at least a dozen parties. The approach has been made easier by the opening to the public of the West Side Highway, so that the climb can now be made readily via Klapatche Park and Puyallup Cleaver.

Little Tahoma (11,117-foot Spur on the East Flank of Mount Rainier)

Little Tahoma is by far the most prominent cleaver rising above the slopes of the mountain. A remnant of the earlier uneroded form of the Mount Rainier volcanic cone, this sharp pinnacle of extremely rotten rock is often considered a more difficult climb than its more massive neighbor. The climb is made up the steep snowfields of Whitman Glacier on its back slope, via an approach from either Summerland and Fryingpan Glacier or from Paradise by a crossing of Cowlitz and Ingraham glaciers.

The first ascent of Little Tahoma was made on August 29, 1895 by J. B. Flett and H. H. Garrison. The peak is today climbed each summer by about a dozen parties.

Little Tahoma was ascended and descended on skis by Paul Gilbreath and J. Wendell Trosper in April 1933. According to Trosper's oral account of this trip the two men used skis to "within eight feet of the top" of Little Tahoma, a remarkable achievement considering the steepness of the last 1000 feet of the peak. They enjoyed good skiing conditions on the descent.

Success Cleaver

Dominating the left skyline of Mount Rainier in the popular view from Paradise Valley is the only all-rock route to the 14,000-foot level on the mountain. Success Cleaver rises from the fir-dotted meadows of Indian Henry's Hunting Ground in a series of downward sloping ledges and jagged, knife-edged cockscombs to Point Success. This ridge has never been a popular climbing route, for it has been ascended by only about a dozen parties in all. However, for those who seek a "dry" (and dusty) climb on this heavily-glaciered peak, with interesting views of the upper Kautz and South Tahoma glaciers, Success Cleaver offers that distinction.

Although the logical approach to this ridge is from Indian Henry's Hunting Ground, Success Cleaver was first climbed from Paradise Valley by two eager young men of the 1905 Sierra Club Outing. Upon hearing that another party was making an attempt on Success Cleaver from Indian

Henry's, Ernest Dudley and John R. Glascock quickly took off from Paradise Valley, crossed the Nisqually, Van Trump, Kautz, Pyramid, and Success glaciers, and in an adventure that reads like fiction attained Point Success on July 27, 1905. (*Sunset Magazine,* November 1905; *Seattle Post-Intelligencer,* July 27, 1905).

The exact route followed by the two Californians is somewhat vague in regard to the point at which they began the ascent of the Cleaver itself, but there is no doubt that they reached the summit by traversing Point Success from the rocky ridges below. The descent was made with other members of the Sierra Club-Mazama Club Outing who had come up the Gibraltar Route the same day.

Subsequent Ascents of Success Cleaver:

1912, July 2: Joseph Stamphler, Phil Barrett, Frank Kandle—descent via Gibraltar Route. (*The Mountaineer,* 1920, vol. 13.)

1914, July 28: Joseph Stamphler, Dr. Karl F. Meyer, W. N. Ellis, Fred Vinton, Alvin Bogardus—return via Gibraltar. (*The Mountaineer,* 1920, vol. 13.)

1914, August 15: Joseph Stamphler, Henry T. Dill, Margaret Hargrave (Wunderling)—first ascent of Success Cleaver by a woman—descent by same route. (*The Mountaineer,* 1920, Vol. 13; correspondence with Mrs. Wunderling, 1949.)

1918, August 17: J. Harry Weer, R. S. Wainwright, Harry M. Myers (J. H. Weer, "Success Cleaver Route to Rainier's Summit," *The Mountaineer,* 1918, vol. 11.)

1935, September 1: Granville Jensen, George MacGowan.

1937: J. Wendell Trosper and party. (Personal communication.)

Since World War II Success Cleaver has been climbed by about six parties, one including Marion Long, second woman to make the ascent. (*The Mountaineer,* 1949, vol. 40:13.)

Fuhrer Finger

On July 2, 1920, another route was pioneered to the summit from Paradise Valley. A party consisting of Hans and Heinie Fuhrer, Joseph T. Hazard, Peyton Farrer, and Thomas Hermans took "the shortest distance between two points" and headed directly up the mountain from the valley. The party crossed Nisqually Glacier and climbed through the crevassed fields to the head of Wilson Glacier, where a long and steep snow-filled couloir allowed them direct access to the summit snow-dome at the upper west edge of Nisqually Glacier. Although originally called "a climb of the

Nisqually Glacier," the party was on the Nisqually only in its lower and upper portions. The snow couloir is now known as Fuhrer Finger, named in honor of the two popular Swiss-guide brothers of the early 1920's. Although this is the shortest route to Rainier's summit from any side of the peak, the lack of a comfortable high campsite has discouraged frequent use of this couloir. (Joseph T. Hazard, *Glacier Playfields of Mount Rainier.*)

Subsequent Ascents of Fuhrer Finger

1934, August 30: William J. Butler made the ascent to the summit and return to Paradise in 11 hours 20 minutes, round-trip.

1935, August: J. Wendell Trosper, Paul Gilbreath, Stan Dickinson.

1947: George R. Senner and Robert W. Weber.

1949: Robert W. Craig and Robert O'Brien.

1949: James Whittaker and party.

1951, April 13: The practicality of this fast route was demonstrated when a National Park Service ranger party made a non-stop ascent in an effort to aid Lieut. John Hodgkins, who had just made the first plane landing (unauthorized) on Rainier's summit. Fortunately for the climbers (William J. Butler, Delmer Armstrong, E. Robert Johnson, Dee Molenaar), who visualized having to help the pilot down the mountain, Hodgkins managed to glide his stalled Piper Cub off the summit before rescue efforts were required. A cold night was spent by the climbing party as they slept in the open saddle between Point Success and the crater.

1956: Walt Gonnason and Bruce B. Gilbert.

Several others made the ascent during the summer of 1956, indicative of the growing popularity of this direct, non-stop route to Rainier's summit.

Ptarmigan Ridge

During the mid-thirties (1933-1938) the search for new routes became focused on the north and northwest flanks of Mount Rainier. In part this growing interest was due to the construction of graveled roads leading into these hitherto undeveloped sides of the mountain—the Carbon River and new Carbon River-Mowich Lake roads on the northwest corner of the Park, and the new West Side Highway leading from the Nisqually Entrance around to the Puyallup River canyon. However, many young mountaineers also sought diversion from the usual ascents by the well-beaten trails of the Gibraltar ledge and the comparative monotony of the Emmons-Winthrop glaciers.

Ptarmigan Ridge rises from the meadows of Spray Park on the northwest corner of the Park in a series of sharp rocky crests which separate the

deep canyon of North Mowich Glacier on the west from the broad snowfields of Russell Glacier on the east. At 10,500 feet the ridge makes an abrupt rise and becomes almost a face, lined with vertical rock- and ice-cliffs and deeply scoured rock- and ice-couloirs. Above 12,000 feet the ridge again smooths out and ascends toward Liberty Cap as a broad and undulating snow ridge.

Although Ptarmigan Ridge was reportedly climbed in 1905 or 1906 by Lee Pickett "and another man," this ascent has never been substantiated and it is highly doubtful that at that early date such a climb reached above 10,000 feet, where the technical difficulties begin. In 1912, Dora Keene (now Mrs. Handy, A.A.C.), the famous woman-climber of the day who had just made the first ascent of Mount Blackburn, in Alaska, made two brief reconnaissances of this ridge, but these were halted below 10,000 feet by bad weather conditions. (*The Mountaineer,* 1912, vol. 5.)

The first serious attempt to climb Ptarmigan Ridge since the 1912 exploratory trip was made by J. Wendell Trosper, Hans Grage, and Jarvis Wallen during the Labor Day weekend, September 1933. This party was able to ascend the steep rock- and ice-couloir to the west of the prominent 300-foot ice-cliff of the hanging glacier which guards the approaches to the ridge. At about 11,000 feet the lateness of the hour dictated a retreat, with several rappels, back down the icy slope. (*The Mountaineer,* 1933, vol. 26.) The following year, Hans Grage returned to the attack on the ridge with Wolf Bauer. An early summer attempt by these two was rebuffed by blizzard conditions, but they were back again on September 2, determined to force a route up this corner of the mountain. Following the route used in 1933, Bauer and Grage were able to chop their way up the ice-covered rock to about 12,500 feet, above the major climbing difficulties, with only a long, gentle snow slope leading toward Liberty Cap. However, the many hours spent on the steep slopes below had used up most of the day and they were forced to descend. Not desiring to retrace their route down the teacherous couloir, Bauer and Grage worked their way down the upper north edge of North Mowich Glacier to a point from which they were able to traverse back to their high camp on the ridge. (*The Mountaineer,* 1934, vol. 27.)

Smitten by the challenge of Ptarmigan Ridge and frustrated by failure to complete the ascent to the summit in the previous year, Wolf Bauer was back on the mountain again in 1935, this time with Jack Hossack, another outstanding rock- and ice-climber from Seattle. Blessed with ideal weather conditions, but again subjected to the ever-present hazards of falling rock in the steep gullies, these two completed the arduous ascent September 7

MOUNT RAINIER—CREVASSE AND SERACS. *By Bob and Ira Spring.*

MOUNT RAINIER—Winter at Paradise. *By Bob and Ira Spring.*

and 8, traversing the summit and descending to Paradise Valley via the Gibraltar Route. Although at first considering the possibilities of avoiding the rock-strewn chutes on the west side of the ridge by traversing below the 300-foot ice wall to the ice slopes on the east side of the ridge, the unstable aspect of the ice cliff discouraged further conjecture on such a route. With some deviation from the previous year's route in the chutes they were still obliged to use 12 hours of tedious step-cutting on the verglas here and it wasn't until 9 o'clock that evening that the two exhausted climbers attained Liberty Cap. Using sleeping-bag covers for shelter, a hasty bivouac was established here on a gravel slope, a welcome relief from the long hours of danger and tension in the cliffs below. This marks the only time that Liberty Cap has ever acted as host for benighted climbers. (*The Mountaineer,* 1935, vol. 28.)

Following the Bauer-Hossack ascent of 1935, twenty years went by before the next few attempts were made on Ptarmigan Ridge. In the early summer of 1955, and again in 1956, two or three efforts were frustrated by deep snow and dangerous avalanche conditions, the ice wall frequently spewing large fragments onto the steep slopes below. Then, on August 4-5, 1956, the ridge was again climbed to the summit by a party of three from Seattle, Fred Beckey, Herb Staley, and John Rupley. Theirs might well be considered as a new route or as a distinct variation from those taken earlier. Instead of climbing the dangerous rock-gullies on the west side of the ridge crest, this party chose to traverse below the 300-foot ice cliff and onto the steep slopes of the Liberty Cap Glacier beyond. With a support party standing by below to watch their movements and aid in the evacuation of their high-camp equipment, the three climbers negotiated the tricky traverse below the forbidding ice wall, climbed the steep slopes to Liberty Cap, and traversed the summit by way of the Gibraltar Route (*The Mountaineer,* 1956, vol. 50.)

Liberty Ridge

As one views Mount Rainier from the north he is instantly impressed by the tremendous cirque-wall which rises above the head of the Carbon Glacier. Named in honor of Bailey Willis, the distinguished geologist who had contributed much to the knowledge of this side of the peak in his early explorations, Willis Wall overlooks the mountain's north flanks and rises 4000 feet in a sweeping 45-degree face of crumbling, downward-sloping lava- and ash-ledges and dirty, rock-strewn ice. From the 300-foot thick icecap resting on top of Willis Wall are born the largest avalanches on Mount Rainier. On many a warm day in early summer one can watch portions of this ice cliff detach from the summit icecap and, gathering speed

MOUNT RAINIER—Winter at Paradise. By Bob and Ira Spring.

swiftly down this huge incline, shoot out onto the Carbon Glacier in vast clouds of ice and rock dust. Naturally enough, this wall has never attracted the aspirants for new summit routes.

Willis Wall is bounded on the east by Curtis Ridge, a steep-sided knife-edged arête which separates the Wall from the Winthrop Glacier. The ascent of Curtis Ridge has been attempted often in the past 20 years, but dangerous rockfall and crumbling cliffs have to date forestalled all efforts to climb above the 11,000-foot level. On the west edge of Willis Wall extends the longest and most consistently steep cleaver on the mountain, Liberty Ridge. Rising out of the Carbon Glacier at the 8500-foot level, Liberty Ridge climbs quickly and directly toward Liberty Cap high above, its sharp crest giving obvious meaning to the word "cleaver" as it separates the smooth ice slopes which descend steeply into the gulfs on each side.

On September 29-30, 1935, two weeks after the successful ascent of the neighboring Ptarmigan Ridge, three Seattle climbers accepted the challenge of Liberty Ridge. Ome Daiber, Will H. Borrow, and Arnie Campbell left their car at the Carbon River Road and hiked up the Moraine Park Trail to the lower, heathered portion of Curtis Ridge. There their small tent was pitched for the night at 6000 feet. High above loomed the dark shape of Willis Wall, while to the west and below their camp lay the broad, dirt-covered expanse of the Carbon Glacier. After a cold night the party moved onto the glacier and traversed diagonally upward toward the base of Liberty Ridge. A good deal of time was consumed in finding a route on the heavily crevassed glacier of early fall, and it wasn't until late afternoon that they reached the ridge. After climbing several more hours to about 11,000 feet, they bivouacked for the night in the protection of a rounded, thumb-like shoulder on the ridge.

The next morning the party began the final push toward Liberty Cap which appeared to lean over them from high above. At this late season they met with a great variety of climbing conditions, alternations of hard-crusted snow, glare ice and loose rock; all of these covered by deep drifts of new snow in the upper portion of the ascent. Their route along the ridge varied in angle from 40 to 60 degrees, and in places was nearly vertical, as they worked their way up narrow chutes and steep pitches of rotten volcanic ash and lava. In some spots the covering of new snow over ice rendered their crampons virtually useless. At one time they were clearly reminded of their exposed position by the breaking off of ice from a nearby cliff, the ensuing avalanche sending off silvery streamers of ice particles which slowly settled over the lower slopes. The climb of the high upper lip of a bergschrund brought the party finally to Liberty Cap at 5:30 P.M. Another bivouac was

endured in a steam cave of the summit crater before the descent to Paradise was made via Gibraltar, 68 hours after the three men had left the Carbon River road. (*AAJ*, 1936, 2:4; *The Mountaineer*, 1935, vol. 28.)

Liberty Ridge was climbed again on August 21, 1955, by four climbers from the Yakima Cascadians: Marcel Schuster, Dave Mahre, Mike McGuire, and Gene Prater. Instead of following the ridge crest, as was done by the 1935 party, this group stayed on the ice slopes to the west of the ridge to about the 12,000-foot level, where they cut back across the rocks to the final ice-pitch leading toward Liberty Cap. They climbed with two ropes of two men each, using "all fours"—their front crampon points, axe in one hand, ice piton in the other. Each rope-team moved upward by having each man climb up to his belayer, then a rope length above, thus saving costly time on the tiring 3000-foot ice slope. Some rockfall from the ridge above caused the party anxious moments. (*The Mountaineer*, 1955, vol. 48.)

Sunset Amphitheatre

Until 1937 only one route of ascent had been pioneered on the broad western flank of Mount Rainier, a climb, in 1891, of the Tahoma Glacier. As in the case of the north side routes, this side of the peak was not readily accessible to climbers until the West Side highway was constructed and opened to the public in September 1935.

Bounded on the south by Success Cleaver (climbed in 1905), and on the north by Ptarmigan Ridge (climbed in 1935), the west side of the mountain presents a much-dissected and extensive array of ridges, glaciers, cirques, and steep ice- and rock-slopes, which were virtually unexplored until the late thirties.

Sunset Amphitheatre, the high, many-hued cirque wall rising above the head of the Puyallup Glacier, attracted the interest of two Park Company guides who sought diversion from their frequently monotonous and overly numerous ascents of the Gibraltar Route on the south side of the mountain. On July 12-14, 1937, in a climb hampered by bad weather and cold temperatures, J. Wendell Trosper and Fred Thieme ascended to the cirque above St. Andrews Rock and worked their way up the steep rock-impregnated ice slope to the north end of the high ice cliff above. Here they entered a huge split in the ice face near its base. By working their way into this crevasse and stemming upward against the cold icy walls, they succeeded in attaining the surface of the summit icefield south of Liberty Cap, from which they easily reached Columbia Crest. This route has not been climbed since this pioneering effort. (*The Mountaineer*, 1937, vol. 30.)

Sunset Ridge

Rising above the confluence of the South Mowich and Puyallup glaciers at the 8500-foot level, a long serrated ridge climbs upward to its termination at Liberty Cap in a series of steep ice slopes and crumbling rock-crests. On the north the ridge is flanked by the vast ice sweep of the still-unclimbed Mowich face, while on the south the ridge serves as a spiny backbone and rim to the Sunset Amphitheatre. Owing to its proximity to Sunset Amphitheatre, the name Sunset Ridge was bestowed upon this steep rib by Ome Daiber, who had made plans to climb it after his ascent of Liberty Ridge on the north side. At the last minute Daiber was unable to make the trip, but he suggested to Don M. Woods, widely-traveled climber of the Sierra Club, that the latter take his place in the party, which included Lyman Boyer and Arnie Campbell, both highly experienced on Rainier's ice and crumbling rock.

After a late start from Seattle August 27, 1938, they arrived at Longmire, where they were checked out before driving around the new West Side Highway to the Puyallup River. A short hike brought them to beautiful Klapatche Park, where camp was made for the night. Next morning the three continued up through St. Andrews Park and along the Puyallup Cleaver to about 7500 feet, where they left the ridge and crossed Puyallup Glacier above the upper end of Colonnades Ridge. From here they ascended the icefall of South Mowich Glacier, the climb of which resulted in near catastrophe when Boyer's right crampon broke under the ball of his foot, resulting in loss of the use of the valuable toe section and points. After a quick wiring job they continued the climb and crossed the bergschrund at the base of the 50-degree ice slope which rises toward the ridge high above. A few more hours of steep climbing on this slope brought them to an elevation of 11,000 feet, where, at 5:20 P.M. they decided to pitch camp. By chopping out a platform in the ice and lining it with flat rocks and newspapers for insulation, they established a tent location. A cold night was endured sitting in the tent with their backs resting against the ice outside the shelter while a howling wind tore at them from above.

At 6 o'clock next morning they were again on their way, continuing up the gradually steepening and narrowing ice finger to a saddle in the ridge, where a view overlooking Sunset Amphitheatre was enjoyed. A few hundred feet farther along, the ridge crest brought them to a nasty bit of climbing which involved a drop down over a rotten rock-cliff and a delicate traverse of the crumbling knife-edged ridge. The use of a rope sling around a rock above allowed the last man to drop down safely. Beyond this stretch the party encountered a 50-60-degree ice-névé slope, up which they

climbed for 1000 feet with the aid of the front points of their crampons and ice axe; to have cut steps up this extensive slope would have been out of the question at this late hour. Another 1000 feet of heavily suncupped snow brought them to Liberty Cap at 1 P.M. The traverse to Columbia Crest was hampered by a field of deeply cut suncups. After hastily signing the register at 4 P.M., they began the descent toward Paradise by way of the Kautz Glacier. The exhausting exertions of moving downward through the deep suncups brought them to the Kautz Ice Cliff as darkness was settling over the slopes and great care was needed in their rappels and belays as they lowered themselves down the Kautz ice chute. Midnight found the three weary climbers spending their third night above snowline.

At 6 o'clock next morning the descent was continued down the deeply pitted and frozen snowfields to the Nisqually Glacier and on to Paradise Valley, 24 hours overdue. (*AAJ,* 1939, 3:3; *The Mountaineer,* 1938, vol. 45.)

The second ascent of Sunset Ridge was made on August 10, 1949, by two seasonal Park Rangers Cornelius ("K") Molenaar and George R. Senner. They accomplished the long climb of the ridge and descended via Tahoma Glacier, in 15½ hours round-trip from their high camp at 8300 feet on Colonnade Ridge. During the ascent they found the rappel sling left by the 1938 party. (*The Mountaineer,* 1949, vol. 40; *AAJ,* 1950, 7:4.)

Sunset Ridge-Sunset Amphitheatre Variation

Although listed earlier as an ascent of Sunset Ridge (*The Mountaineer,* 1956, vol. 50) subsequent correspondence has disclosed that in August 1939, J. Wendell Trosper and Hans Grage made what may be called instead a combination of the Sunset Ridge and Sunset Amphitheatre routes. The ascent was made to the head of Puyallup Glacier via St. Andrews Rock, similar to the approach on the Sunset Amphitheatre climb of 1937. From there a traverse was made of the upper Puyallup Glacier below the Amphitheatre cliffs, followed by an ascent of the steep snow-slope which joins the cirque with Sunset Ridge at about 12,000 feet. From there the upper portion of Sunset Ridge was ascended to Liberty Cap.

Nisqually-Gibraltar Chute

Rising steeply toward the upper north end of Gibraltar Rock from the Nisqually Glacier cirque at 11,000 feet is a long couloir which early in the summer is snow-filled, but later on is a dirt- and rock-scoured chute which brings debris from Gibraltar Rock to the glacier below. The regular Gibral-

tar Route intersects the chute at about 12,000 feet and climbs a short distance in the chute before the summit snowfield is reached.

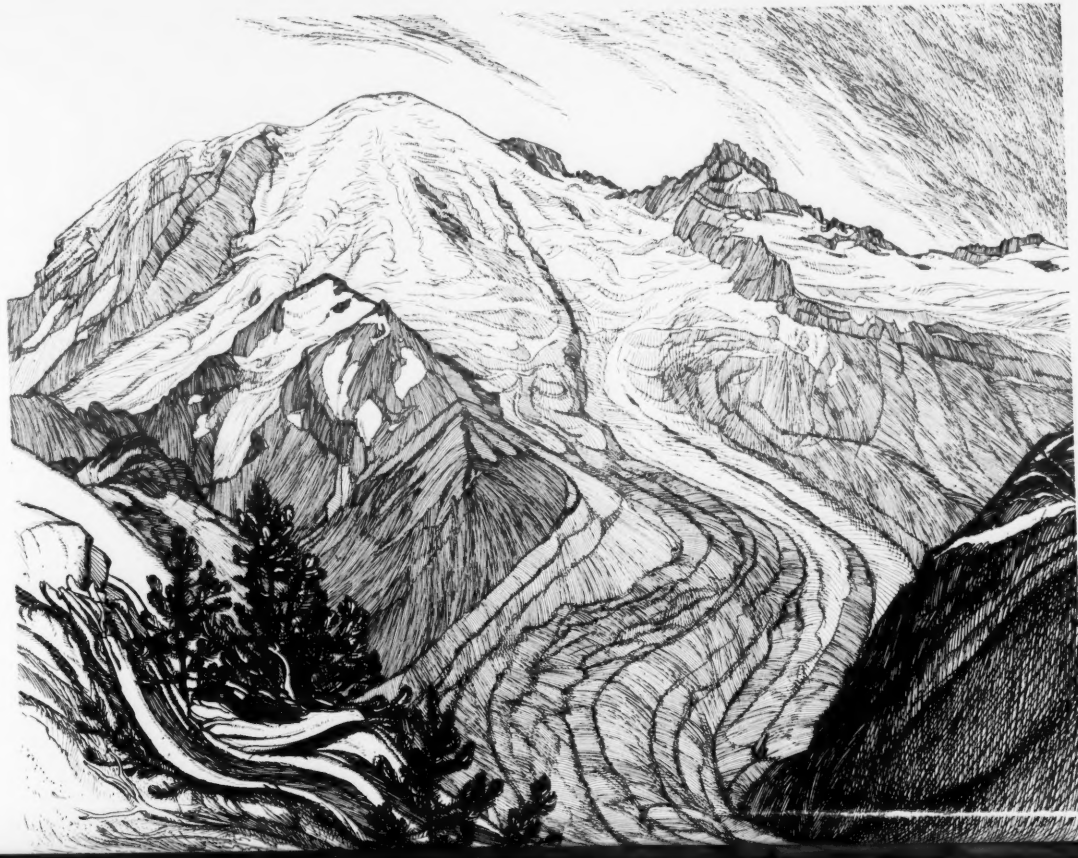
A complete ascent of the Chute, from the Nisqually Glacier via a traverse around from Camp Muir, was reported to the writer by Paul Gilbreath. According to Gilbreath's memory, the climb was made in company with Stan DeBruler and "a man named Hewett" during the summer of 1946. Although no other details were obtained there is no reason to doubt that the climb was made. The descent followed the same route. A descent by this Chute Route was also made by guide Gary Rose and two clients on July 1, 1956.

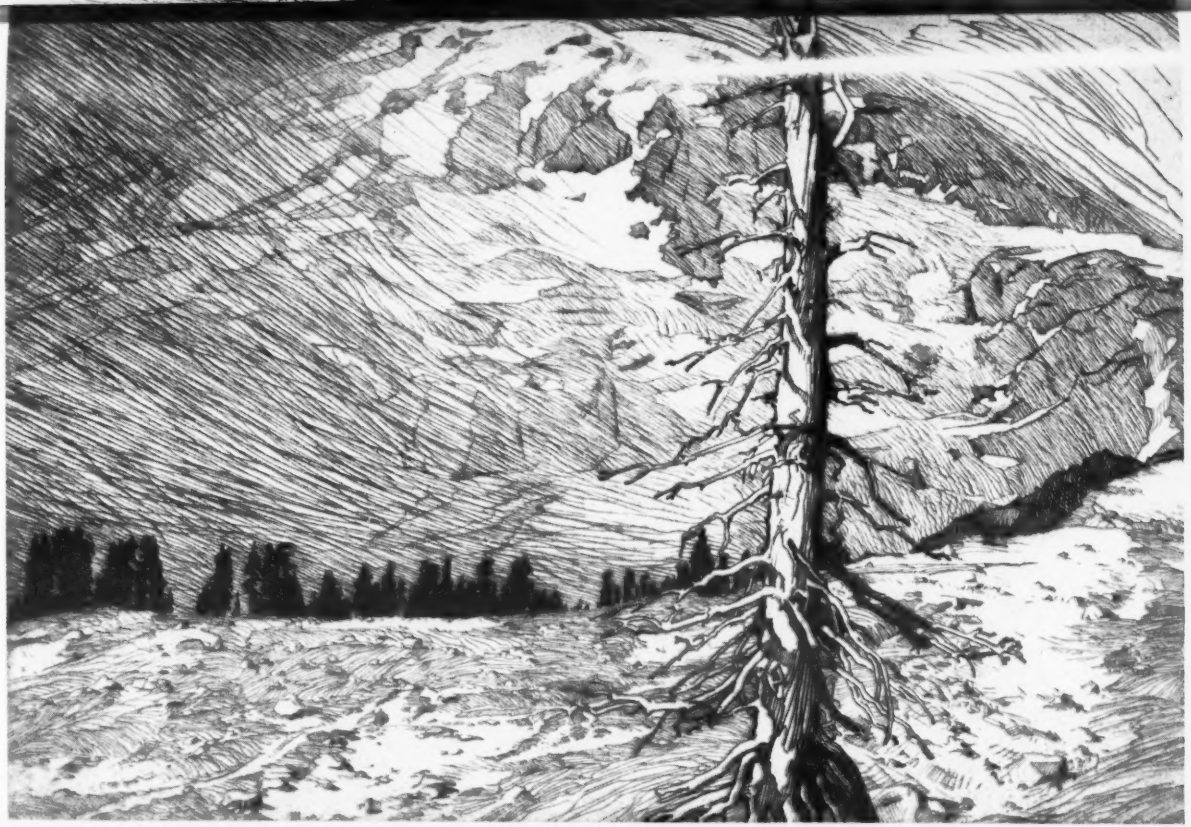
Nisqually Icefall

The Nisqually Glacier, largest on the south side of Mount Rainier, extends from the crater rim and summit dome in a long and tortuous descent of over five miles into the deeply cut, timber-lined canyon opposite Paradise Valley. At 13,000 feet the glacier is split into two ice streams by the rock buttress of Nisqually Cleaver. The eastern half descends toward Gibraltar Rock, where it is again divided, one portion flowing steeply to the north of Gibraltar as Ingraham Glacier, the other portion continuing down the west side of Gibraltar, where it is broken by a 200-foot ice cliff as it becomes a hanging glacier overlooking the Nisqually cirque. The western portion of Nisqually Glacier flows in a jumbled cascade of ice through the narrow constriction between Wapowety Cleaver on the west and Nisqually Cleaver on the east. This is the Nisqually Icefall, the most heavily-broken, steep glacier-area on the mountain. Although in clear view from Paradise Valley during the many years of exploration and development on the south side of the mountain, it was not until 1948 that this line of ascent was seriously considered as a summit route.

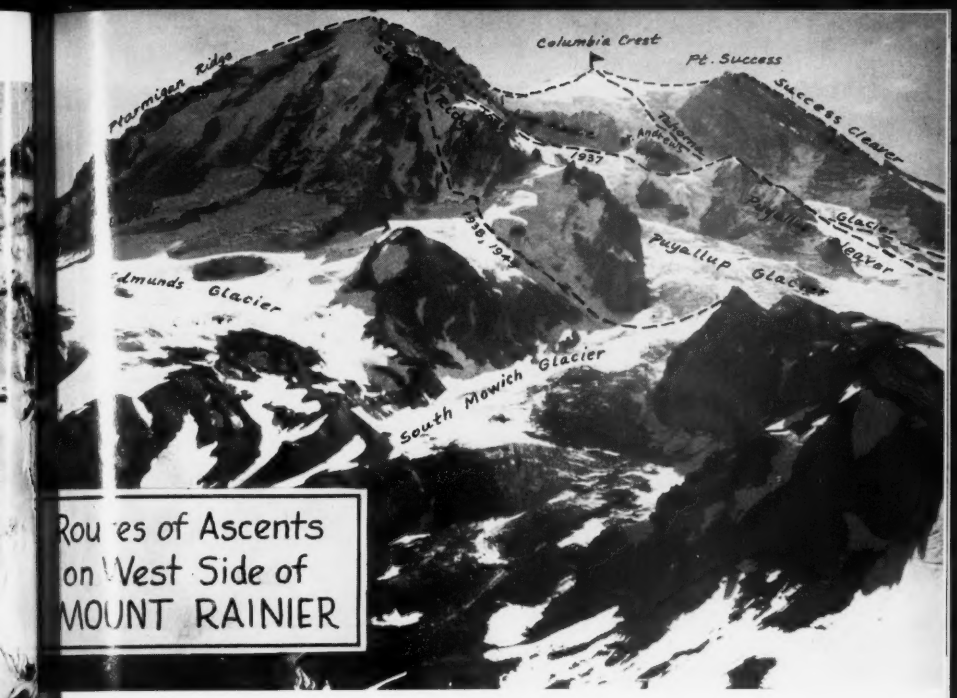
On the afternoon of July 14, 1948, two seasonal rangers and former guides, Robert W. Craig and Dee Molenaar (author of this article), climbed to Camp Muir in preparation for an assault on the icefall early next morning. At the first light of dawn they were winding their way among the long crevasses and debris-remnants of former avalanches from the icefall. Upon reaching the base of the icefall the two proceeded immediately up the steep 500-foot slope which extended into the frozen cascade high above. A sigh of relief accompanied their reaching the inner sanctum of the icefall where they felt no longer fully exposed to the funneling of falling ice. The next eight hours were spent in working a route through the great mass of fallen séracs and debris-filled crevasses. However, the big problem lay above the jumble of the main cascade, where they

MOUNT RAINIER—NISQUALLY GLACIER. *Drawing by Roi Partridge.*

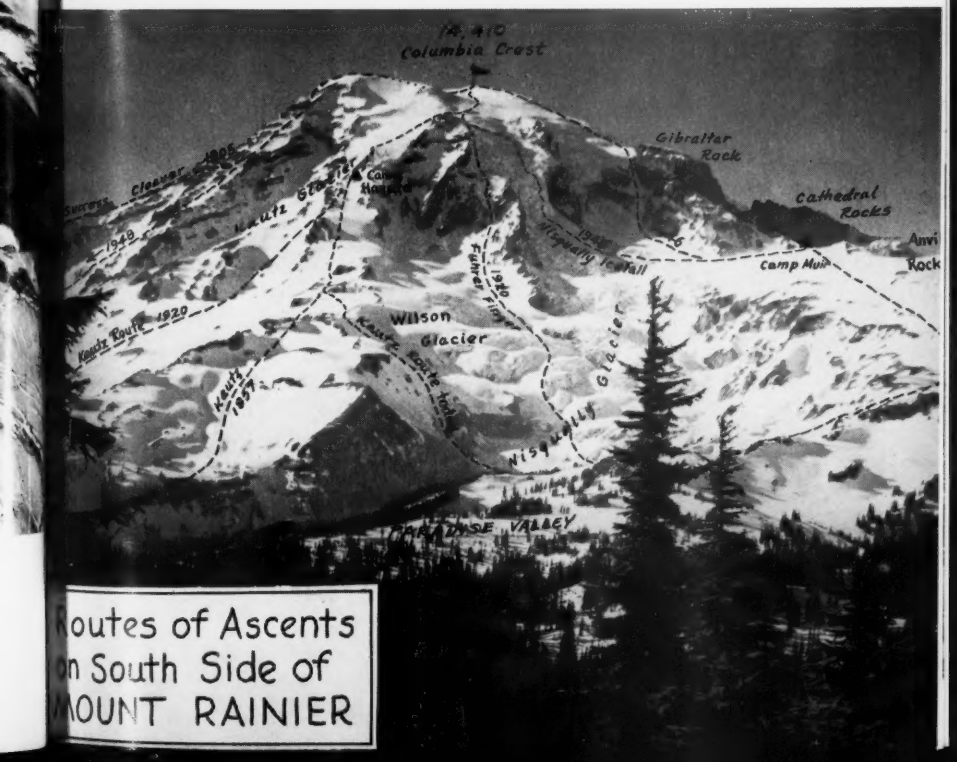




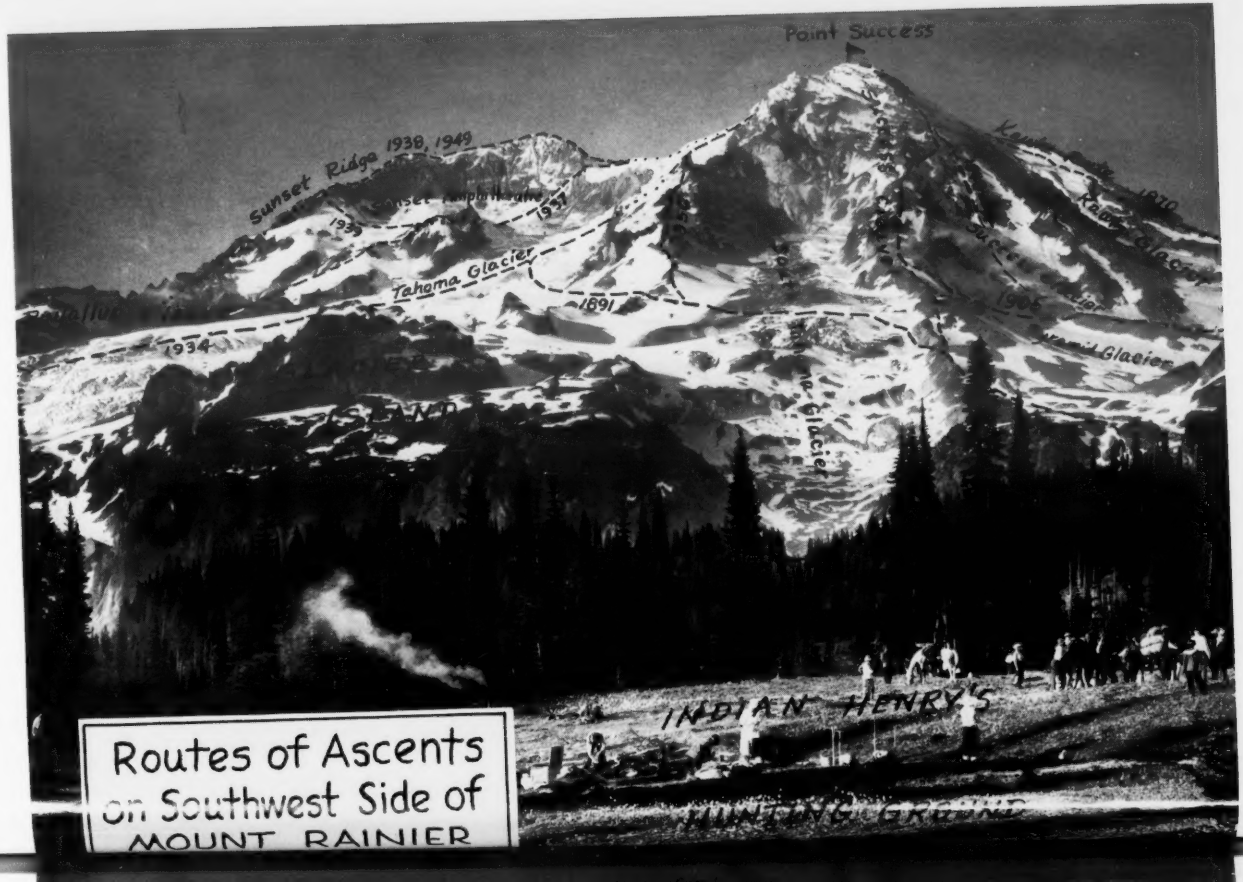
MOUNT RAINIER—In a Robe of Mist. *Etching by Roi Partridge.*

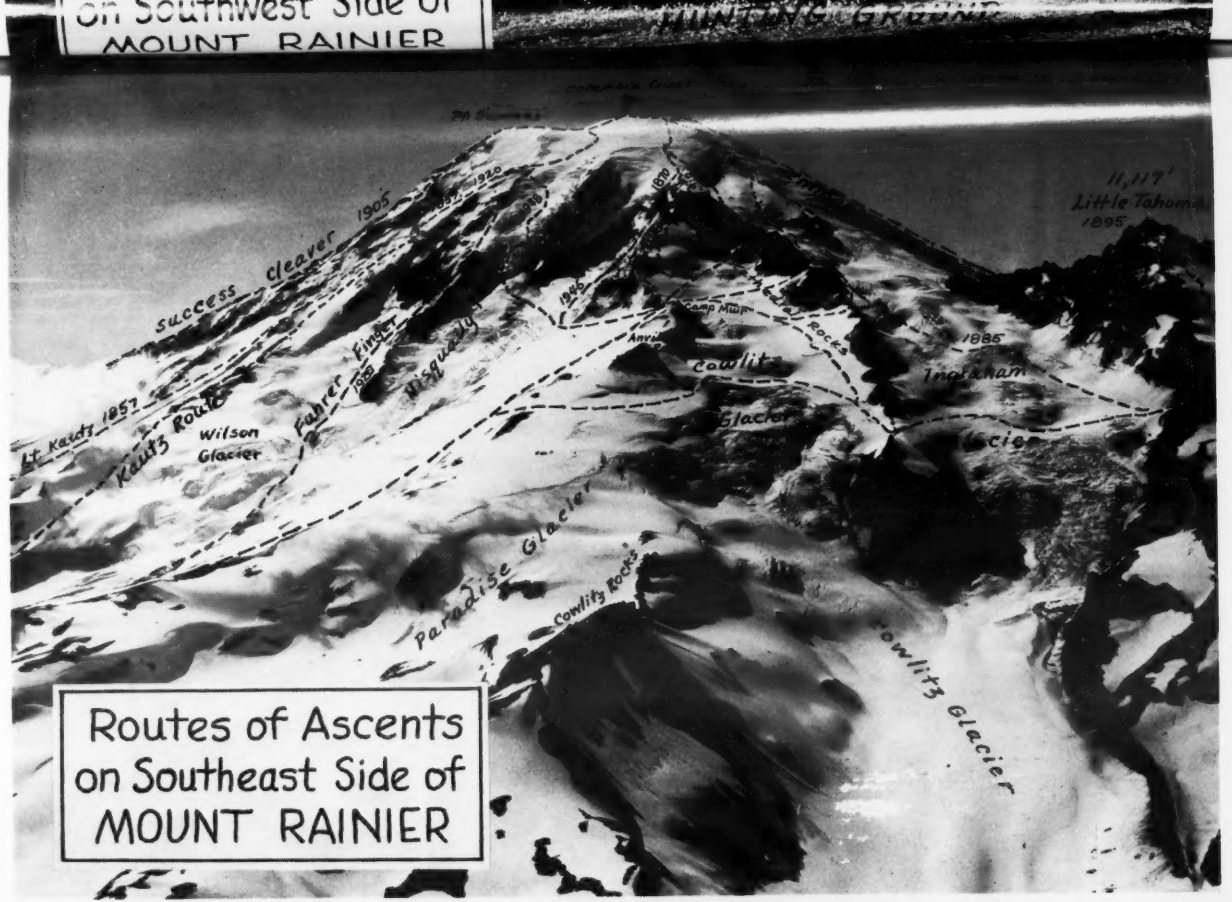


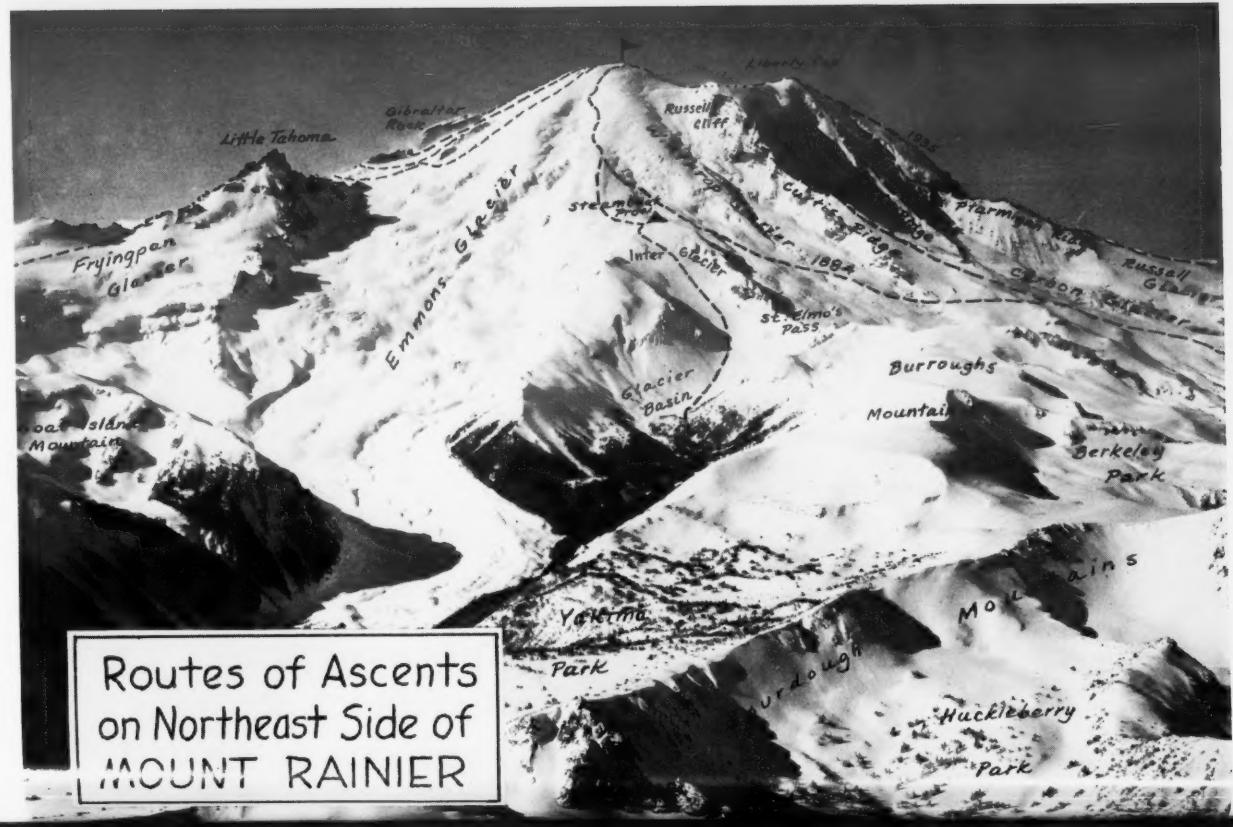
Routes of Ascents on West Side of MOUNT RAINIER



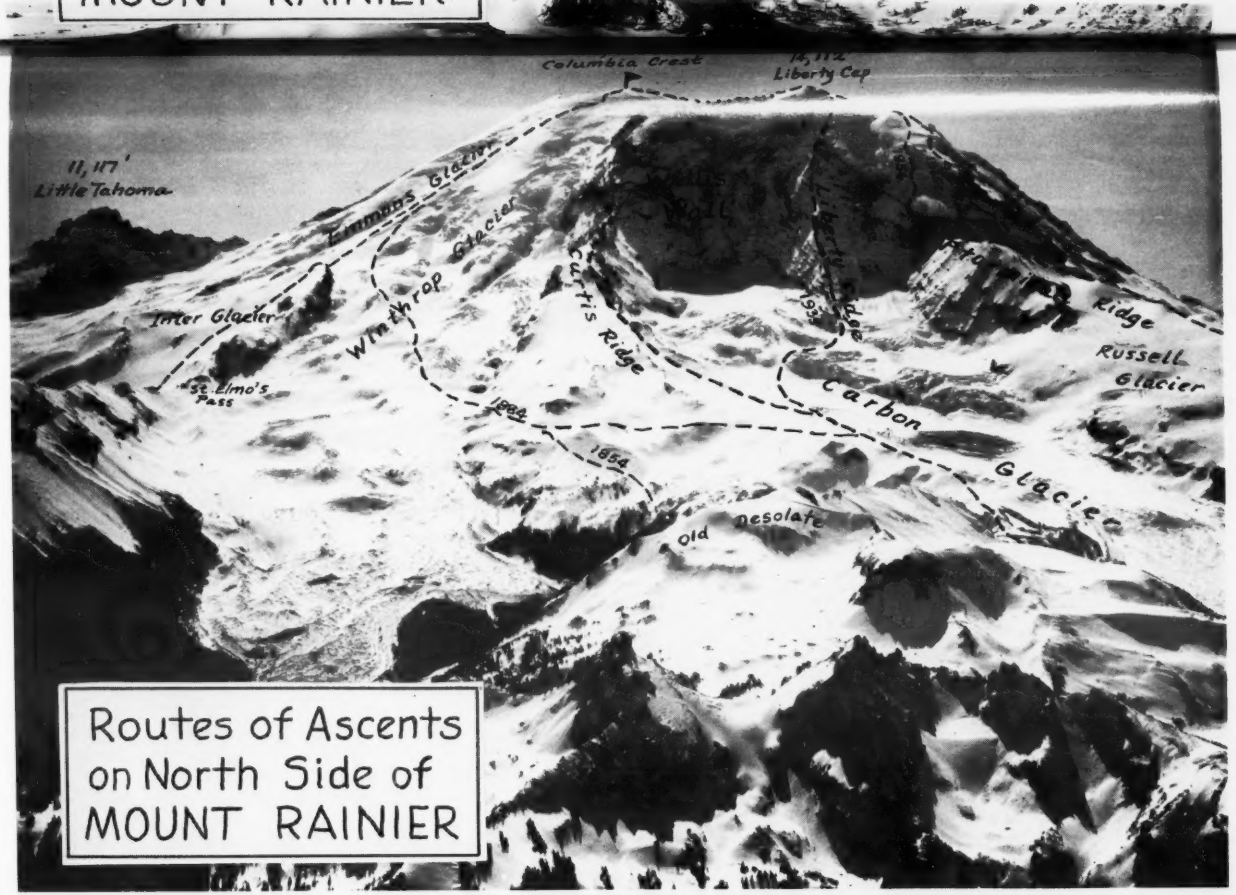
Routes of Ascents on South Side of MOUNT RAINIER

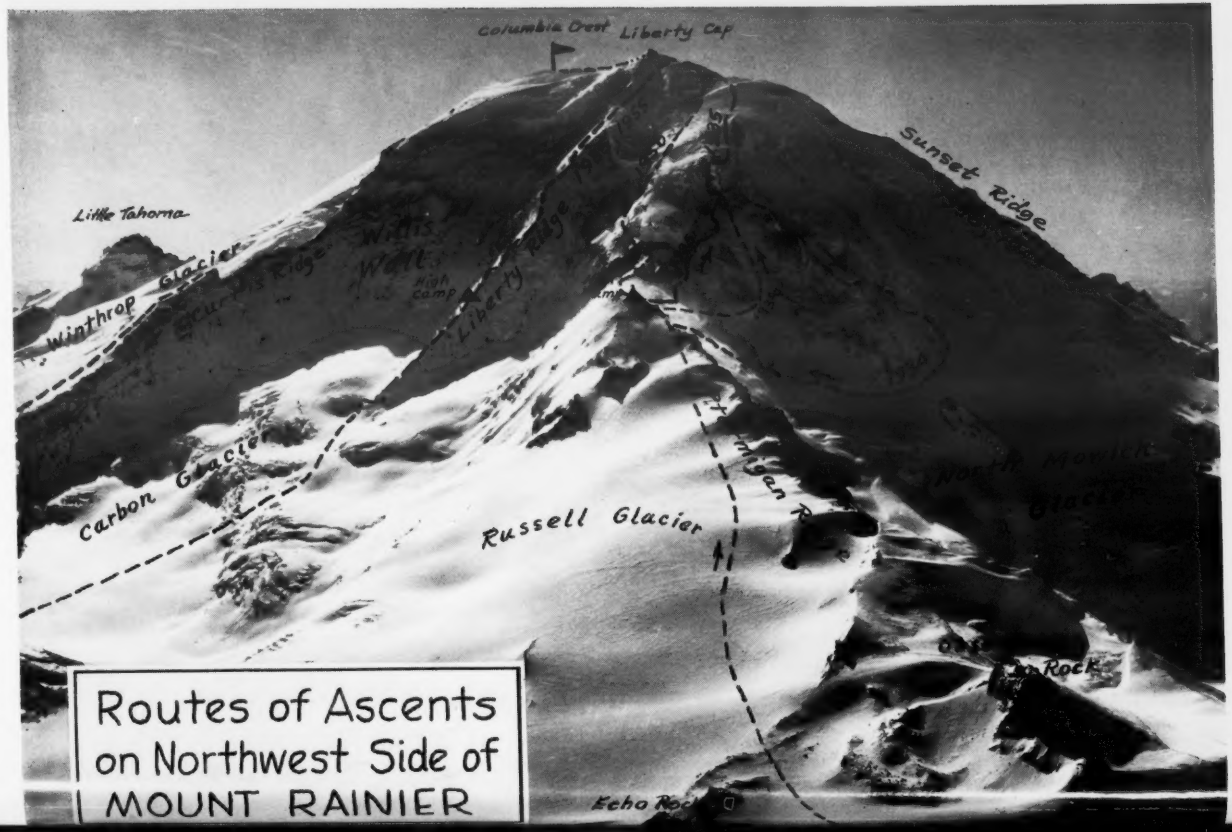

Point Success
Sunset Ridge 1938, 1949
1935
1937
Tahoma Glacier
1891
1934
1906
Glacier
INDIAN HENRY'S
Routes of Ascents
on Southwest Side of
MOUNT RAINIER


Success
Cleaver
1905
1925
1870
1945
Camp Muir
Rocks
1885
Cowlitz
Glacier
Ingraham
Glacier
11,117'
Little Tahoma
1895
Kautz
1857
Kautz Route
Wilson
Glacier
Fahrer
Finger
1929
Nisqually
Paradise Glacier
Cowlitz Rocks
Cowlitz Glacier
Routes of Ascents
on Southeast Side of
MOUNT RAINIER

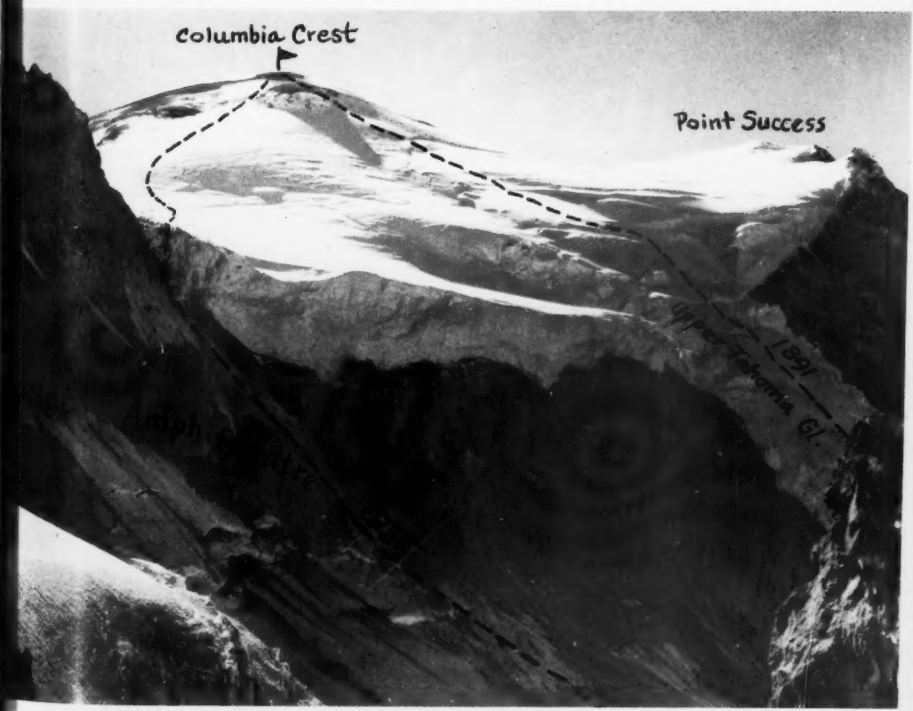


Routes of Ascents on Northeast Side of MOUNT RAINIER


Columbia Crest
14,112
Liberty Cap
11,117'
Little Tahoma
Emmons Glacier
Winthrop Glacier
Curtis Ridge
Inter Glacier
St. Elmo's Pass
1934
1854
Old
Desolate
Carbon
Glacier
Russell
Glacier
Ridge
Routes of Ascents
on North Side of
MOUNT RAINIER


Columbia Crest
Liberty Cap
Sunset Ridge
Little Tahoma
Willis Wall
High Camp
Liberty Ridge
Winthrop Glacier
Curtis Ridge
Carbon Glacier
Russell Glacier
Echo Rock
Routes of Ascents
on Northwest Side of
MOUNT RAINIER

MOUNT RAINIER—Upper Tahoma Glacier and Sunset Amphitheatre



MOUNT RAINIER—Columbia Crest, from 12,500 ft. on Sunset Ridge.

found many large crevasses extending the entire width of the glacier, with upper lips hanging over the steep lower approaches. Once above the 12,000-foot level, however, the glacier assumed a more gradual slope to the crater rim and the two tired climbers reached Columbia Crest at 2:30 P.M. (*A.A.J.*, 1949, 7:2; *The Mountaineer,* 1948, vol. 41.)

Unusual Routes of Descent

1934, Sept. 2: Wolf Bauer and Hans Grage, after reaching 12,500 feet on Ptarmigan Ridge, descended by way of the upper north edge of North Norwich Glacier. (*The Mountaineer,* 1934, vol. 27.)

1948, Aug. 13: Park Rangers Forrest Johnson and George R. Senner, after ascent of Success Cleaver, descended by way of a long snow-couloir above the head of Success Glacier, between Success Cleaver and Kautz Cleaver.

1946: Paul Gilbreath, Stan DeBruler, and another man ascended and descended Nisqually-Gibraltar Chute.

1956, July 1: Guide Gary Rose and two clients repeated the descent of this Chute.

1956, Aug. 12: Dr. William K. Rieben and Ulrich Schlaepfer descended Gibraltar Chute and lower west face of Gibraltar Rock.

Miscellaneous Statistics

Number of people who have reached the summit: 1852 to 1915—575; 1916 to 1935—3400 (guided, 2855; independent, 545); 1936 to 1956—5025 (estimated; based on summit register and application forms; no consistent tabulation of guided ascents for this period); Total—9000.

Number of routes climbed by individuals: By 1935 only two, Hans Fuhrer and Grenville Jensen, had ascended the mountain by as many as five different routes. Today, so many have equalled this number that only those who have exceeded it are listed: George R. Senner—9, J. Wendell Trosper—9, Dee Molenaar—8, Robert W. Craig—7, Elvin R. (Bob) Johnson—7, Cornelius (K) Molenaar—7, Lloyd Anderson—6, Paul Gilbreath—6, Al Krup—6, Dr. Warren B. Spickard—6.

Conclusion

In accounts of the earlier ascents it is apparent that the writers were often handicapped in their descriptions by lack of definite place names. However, by diligent study of the newspaper and magazine articles of the time, the general routes followed have been fairly well established, notwithstanding varying editorial treatment of the original accounts. Corrections and additions, not only of the earlier records, but of subsequent data, will be wel-

comed by the author and by Aubrey L. Haines, both of whom are engaged in further development of the history of climbing on Mount Rainier.

Today Mount Rainier is climbed each summer by 150 to 200 people, who accomplish the ascent either as members of organized climbing-club parties, as clients of the government-authorized Guide Service, or as members of small independent parties. All but the professionally guided climbers are required to obtain permission to make the ascent from Park Rangers qualified to judge the applicants' experience, physical fitness, and equipment. As a result of this inspection and control very few accidents have occurred in recent years. Indeed, when one considers the inherent dangers of the mountain, with its extremely rotten rock and heavily broken glaciers and icefalls, and the great numbers who make the ascent each year, it is remarkable that less than a dozen lives have been lost in mountaineering accidents on Mount Rainier in its 100-year climbing history.

Yet the element of adventure has not been lost. Numerous unclimbed and untried routes will continue to stimulate the imagination of coming generations of mountaineers, and countless variations exist on old lines of ascent to entice exploration. Well established and heavily traveled routes will continue to change from year to year, as glaciers shrink or grow, or as the rotten lava-ridges alter their configuration with each loosened rock. As in all outdoor experiences, the element of an ever-changing weather makes each ascent a different experience from the preceding, as does the particular composition of the climbing party itself.

It has been said that to a great extent a mountain's "personality" is a reflection of the character and personality of those who have given the best of themselves in the effort to know intimately the secrets hidden among the high ridges and cirques and across the distant expanses of vast icefields. To many American mountaineers, Mount Rainier represents far more than a geological phenomenon of volcanic rubble and glacier ice. As the Matterhorn was to Whymper and Mount Everest to Mallory, so is The Mountain to those who have come to know and love her as a perennial source of physical rejuvenation and aesthetic inspiration.

West Face of Snowpatch

JAMES P. McCARTHY

HIGH above was Snowpatch, a great, black shape looming over us in the evening sky. Once more Hans Kraus, John Rupley, and I had been drawn back to the Bugaboos. Supper over, we sat quietly among the rocks which served as our kitchen. Hans, gazing at the mountain above us, was smiling quietly. John, busying himself with some camp chores, seemed to be in a contemplative mood. I found my own thoughts slipping inevitably back to the first time I had seen this sight. It was two years before, and we three were together then as now, although then members of a larger party. At that time we had come to the Bugaboos with respect and awe, humbly expecting merely to repeat the established routes. This we did on several of the peaks, increasing our knowledge of the rock and absorbing that elusive, instinctive knowledge of the mountains, called "feel." When, finally, we had acquired enough condition and confidence, we attempted Snowpatch, by its regular route. Success bolstered our confidence in our ability to handle the rock and turned our minds toward more ambitious schemes. We were informed that the previous year, 1953, Gary Driggs had attempted the West Face unsuccessfully. One look at the projected route was more than enough to convince us that we should attempt it. However, the weather closed in and ended all thoughts of such a climb that season.

The next summer, 1955, John and I were again at the Bugaboos. This time we had come prepared to try the West Face. Much time had been spent in climbing on severe rock, and we felt more experienced and capable of handling a big climb. Furthermore, we had proved our teamwork and condition on a new route on Devils Tower. We felt certain that we were climbing at the highest level of our careers and felt reasonably confident of success. This confidence was short-lived as we began to feel the extremity of our position. The sense of isolation and lack of support faced by two climbers attempting a new route on one of the most formidable mountains in Canada, eventually forced a decision not to attempt the climb.

So we waited another year—a year spent in more practice on the most severe rock we could find; polishing the technique of sixth-class climbing until it became more or less second nature. Finally we were back again,

ready to attempt a long, sixth-class route in the big mountains. We fully expected to face extended difficulty of a more severe degree than previously had been attempted in this hemisphere. But we also felt we were as well prepared as possible. In the past three years we had acquired the feel of the mountains, gained much valuable experience, and learned to work as a team. Feeling at home among these towering peaks was an important factor in our assurance of preparedness. Another consideration on a climb of this sort is the feeling of being "backed up" or supported. In the Alps this support is provided in part by the hut systems, which give fairly easy access to the climbs. Also, there is the comforting knowledge that others have attempted and have been successful on difficult routes in the same area. Finally, there are relatively large numbers of climbers in the vicinity in case of accident.

One finds none of these important factors present in the Bugaboos. We decided to try to solve the problem of support in several ways. First, we planned to use a party of three rather than a smaller but weaker party of two. Then, instead of relying upon a timberline camp, we placed a camp very close to the base of climb. Finally, we were fortunate enough to have Bob Larsen and Oskar Dorfmann, two fine mountaineers, as a support party.

Preparations completed, we stood below the climb. We watched the setting sun brush the vast panorama of mountains with a reddish glow and agreed that the view alone was worth the effort of packing to the high camp.

The next morning our good weather was holding. We started out on the short walk to the base of the climb, which was in a fall line 150 feet south of the summit block. When we reached the base of the climb we lost no time in readying our gear. To others we might have seemed unduly anxious to start. Actually, we had been getting ourselves "up" for a big effort, and once "up" we felt compelled to move. John started off the first pitch and moved quickly and smoothly over the easy rock. Hans and I followed, and the serious effort began. The next pitch was mine and still fairly easy. The only difficulty was stepping from a crack into a corner. But it involved only a moderate stretch, and presently Hans joined me on a ledge I had chosen as a belay point. This was the highest point John and I had reached the year before. Barely stopping to catch his breath, Hans took the lead and moved confidently and smoothly up a long crack and soon reached an overhang. A stirrup, a fine hold, and he was standing on a small ledge above the overhang.

While Hans was leading this pitch, John and I belayed his ropes and were plagued with the anxiety which never leaves a climber who belays

a leader on a difficult pitch. We both found it heartening to see Hans climbing without difficulty and felt even better when he said it looked good from where he was. When I reached Hans, he pointed to a short crack that I had to climb to get out of the way. Three stirrups quickly solved the problem, and I found a good belay stance 15 feet above Hans as he brought John up. Reaching my ledge, John took over and moved carefully and easily up a crack to the right. The pitch offered little difficulty to John, and soon he was ready to take us up. When I reached John, I surveyed the situation as Hans came up.

The next lead was mine, and I had to pick the right route from the possibilities that opened up. At this level the face eases back to a more comfortable angle, and a choice is offered of two or three routes. I finally decided to go left to reach the top of a rib which seemed promising. Then I started out. By this time we were far enough above the scree to have a feeling of space underneath. I always find this exhilarating. My muscles were beginning to loosen up, and I moved easily and lightly. Retracing my footsteps along the slanting edge, I began to traverse the ribs. One stirrup allowed me to cross the first rib. I found myself faced with a rib which I had to climb to reach a belay stance. By placing two stirrups, I reached the top of the rib. One very delicate step and I was on a belay edge. When I looked back, Hans appeared quite relieved as he started to join me.

Hans took the gear and began to work on what was to be the key pitch. Climbing with great precision and economy, he moved slowly and carefully over two ribs, heading for a corner. Here the rock had again become steep, making friction difficult. The climbing was delicate indeed. With about 80 feet of rope out, Hans was faced with the problem of doing a stirrup traverse under a ledge and then climbing over a bulging overhang. Carefully manipulating his stirrup and ropes to provide maximum protection and minimum drag, he started across. Working deftly, and seemingly unaware of the steepness of the rock, he moved across the traverse and over the bulge in a triumph of sixth-class technique. Here indeed was the finished product: the ability to move easily and confidently over rock which will not accommodate a climber without direct aid. Many people, exposed to the complication of artificial technique, with all its pitons and stirrups and ropes, immediately jump to the conclusion that the climber is tied down and encumbered. This is far from true. All the hammers, the pitons, the carabiners, the ropes, and the stirrups are tools. With sufficient practice and experience they become easily manipulated. Once this proficiency has been reached, the climber is free to pursue his bound-

ing imagination and desire. He is free to seek out the high, steep faces, free to seek the feeling of height and space, free from the necessity of a route that must open up for his hands and feet. With this freedom, Hans moved over the crucial pitch, sure and unhurried.

John moved up to the belay stance and stepped across a rib to his left. Taking full advantage of his unusual reach, he began placing pitons in a vertical crack and was soon on a secure stance. When I arrived and took the next pitch, I could see that it was difficult for perhaps 25 feet and then eased off. The pitch began with a slab. A thin layback allowed me to reach a crack for a piton. A step to the ledge, an easy traverse to the left, and it was easy climbing as far as my rope permitted.

We knew we were near the summit, and tension was high as Hans moved up on the next pitch. There was a wide crack which would not take good pitons. Hans skillfully placed his pitons, and another difficulty was overcome. At the next belay point we could see the summit itself. Everyone was elated. Ahead was a narrow, slightly overhanging chimney. When I reached it, I found it pressed in so much that I could hardly move. I freed myself, placed a stirrup piton and was soon on a large ledge. Then we climbed continuously up easy ledges on the next pitch. This was the first pitch that was not demanding since we had left the ground.

We arrived at the summit and did all the traditional things: shook hands, signed in, ate lunch, and admired the view. Resting on top, we were soon launched on a discussion of our climb. My own reaction was one of surprise. In a period of eight and one-half hours three of us had climbed a new and difficult route. Each pitch required a high order of climbing and therefore a great deal of effort. Still, we had not been subjected to great strain. The comparatively easy climb was the result of teamwork reached through long, continued practice.

John and I had the good fortune to meet Hans Kraus while we were in college. We had been climbing together on difficult rock for at least three years before this climb. Those three years of practice accounted for our success. In the hundreds of practice climbs we had increased our efficiency in dealing with the myriad details of modern sixth-class technique, so that little time was lost in performing small but important details. Despite their importance they remain details, part of a technique. What I have said about technique cannot be overstated. A new generation of climbers is coming of age, faced with the realization that the previous generation has done most of the work in exploration and in climbing the important peaks. Is it any wonder that our hopes and desires should find expression in the steep faces and soaring ridges? This search for more

difficult routes is a swiftly growing movement. And when the rock does not open up for our hands and feet, we must use the sixth-class technique. But it is just a technique. The pounding of pitons and star drills and the snapping of carabiners is not the "be-all" and "end-all" of this sort of climbing, as some would have you believe. It is a means by which we may seek out space and air on sheer walls and sweeping ridges.

In the ensuing years we may expect to see more and more climbers of ambition equipped with this technique. Their accomplishments will far overshadow anything we have done on Snowpatch. We hope we have helped to show the way.

Summary of Statistics

ASCENT: West Face of Snowpatch, Purcell Range, British Columbia. First ascent of this face, 1956.

PERSONNEL: Hans Kraus, James P. McCarthy, John Rupley.

The Mountains of Nevada

WELDON F. HEALD

THERE is a small but fast-growing group of Nevada mountain enthusiasts. It consists of those who have discovered that some of our most beautiful and spectacular mountain country is in the Sagebrush State. They are the ones who have climbed far above the parched desert valleys and found islands of alpine climate containing evergreen forests, rushing streams, shimmering lakes, and wild flower meadows high up under snow-spotted peaks. As a result, most of these people have fallen under the spell of this vast exhilarating land, with its sparkling air, blue skies, and magnificent distances.

For Nevada, usually thought of as the driest and most barren part of the "Great American Desert," is actually one of the most mountainous states. Although basically a great plateau, 3500 to 6000 feet above sea level, there are 120 named ranges rising from it, and one-half of Nevada's 110,000 square-mile area is occupied by mountains. Among them are scores of summits exceeding 10,000 feet elevation, many from 11,000 to 12,000 feet, and two that top 13,000 feet.

Mostly long and narrow, these ranges stretch north and south in parallel rows, alternating with broad, straight valleys, and roughly resemble the corrugations on an iron roof. Early geologists called this type of topography "Basin-and-Range" structure and, although found throughout the American Southwest, it reaches its best development in Nevada. For millions of years in the geological past the region was subjected to a gigantic squeeze play, and nearly all these ranges are fault blocks that have been forced upward above the general level of the plain. Now carved by erosion into peaks, canyons and cliffs, they still show their violent tectonic origin by the startling abruptness with which they rise 3500 to 9000 feet directly from the valleys.

It is this tremendous difference in elevation within a short horizontal distance that gives Nevada's mountains such variety and fascination. The desert plateau receives little precipitation and almost the entire state lies within the Great Basin, where evaporation exceeds runoff and no stream reaches the Pacific. But moisture increases rapidly with altitude, while the temperature falls, so that there are some Nevada ranges in which, within

the space of five miles, are compressed all the climatic conditions represented in 2000 miles of latitude.

This sharp variation in climate with increasing elevation is indicated by different bands of vegetation on the mountain slopes, one above another, almost as distinct as layers in a *pousse café*. Upward from the treeless valleys extends a zone of piñon-juniper woodland, 6500-8000 feet altitude, typical throughout the state. Many ranges are barren otherwise, or carry scattered aspen groves, which make ragged patches of gold in autumn. Others have a transition belt of ponderosa pine, bristlecone pine, Douglas and white firs, averaging 8000 to 9000 feet elevation, and the highest support subalpine forests of Engelmann spruce, firs, and limber pines. Timberline varies, north to south, from 10,000 to 11,000 feet; and above, the bleak arctic-alpine zone sweeps up to the loftiest summits. There is, however, no regional snow-line, but several peaks harbor permanent fields of snow and ice, and one has the distinction of possessing the only true glacier in the Great Basin region, east of California's High Sierra rim.

Although most of Nevada's mountain areas have a family resemblance, it is remarkable how much they differ individually. Each shows distinctive characteristics of vegetation, geology, and topography which set it apart from the others. Sixteen ranges contain timber or protective watershed vegetation important enough to be administered by the United States Forest Service and they compose widely separated divisions of the Humboldt, Nevada, and Toiyabe national forests. With a total area of more than five million acres, these publicly owned reservations provide local lumber and firewood, summer forage for cattle and sheep, wildlife management areas, and outdoor recreation. Forest Service access roads have been built into the mountains, improved auto campgrounds are numerous, and hundreds of miles of trails make the high country easy to explore.

However, there is little technical climbing in Nevada and most of the highest summits are walkups or simple scrambles. True, good rock climbs can be found in many canyons and the peaks are often heavily snow-covered in early summer. But there is not much to interest the serious mountaineer. On the other hand the state provides a superlative field for outdoor enthusiasts who indulge in hiking, knapsacking, camping, and horseback riding. In fact, perhaps even for the mountaineer, these little-known and seldom-visited ranges are worthy of a few days limbering-up exercises on the way to the Cascades, Rockies, or the Himalayas. Information about climbs in the Nevada mountains may be obtained from the Desert Peaks Section of the Sierra Club, an active group specializing in week-end outings among the desert ranges of the Far West. A chapter of

the Sierra Club has recently been formed in Reno, called the Toiyabe chapter.

Along the west border, neighboring California contributes considerably to the state's mountainous area. There the eastern spurs of the Sierra Nevada extend over the line and rise in a granite-ribbed escarpment, fifty miles long. One-third of famed Lake Tahoe is in Nevada and several Sierra summits here reach altitudes of 10,000 to 11,000 feet. This section receives the state's heaviest snowfall and Mount Rose, 10,800 feet, twenty miles south of Reno, is Nevada's foremost winter sports center. Again, further south, the state line snips off the most northerly summit of California's lofty White Mountains, thereby giving Nevada its highest point, Boundary Peak, 13,145 feet elevation. Neither of these areas is typical, however, and Boundary Peak is not as impressive as many other Nevada mountains. Also near the California border, but more representative, is the Wassuk Range, which rises steeply from the west shore of thirty-mile-long Walker Lake. A narrow mountain road ascends almost to the summit of Mount Grant, 11,303 feet, the highest point.

In the far southern tip of the state, Las Vegas has a popular summer and winter recreation area in the Spring Mountains, generally known as the Charlestons. This range extends north and south for seventy miles and culminates in one of Nevada's highest and most majestic groups of peaks. Here, evergreen-forested slopes soar abruptly 9000 feet above the arid valleys like a green island in a sea of desert. A paved road leads to a resort situated in a great horseshoe of 4000-foot limestone cliffs, and an eight-mile trail climbs Charleston Peak, 11,910 feet. On the way is one of the finest stands of bristlecone pines in the United States, and the superb view includes points in Nevada, California, Arizona, and Utah.

But the greatest concentration of high ranges is in central Nevada, where four stand in a row between Tonopah on the south and Austin to the north. Farthest west are the Shoshone Mountains, with several summits over 10,000 feet elevation. East of them, the twin Toiyabe and Toquima ranges face each other for a distance of eighty miles across deep, corridor-like Great Smoky Valley. High point of the former is Arc Dome, 11,775 feet; and Mount Jefferson, 11,807 feet, tops the latter. A paved highway traverses the valley and spur roads reach several campgrounds from which the mountains are accessible by trail. Next east is the Monitor Range, a hundred miles long, with many summits between 10,000 and 11,000 feet elevation.

Another group of high ranges is in the eastern part of the state, paralleling the Utah border. Among these are the White Pine Mountains, with

Duckwater Mountain, 11,493 feet, and the Grant Range, rising to Troy Peak, 11,268 feet. South of the copper-mining town of Ely is the Egan Range, and to the east, the Schell Creek Range, culminating in North Schell Peak, 11,890 feet. In the former is located a well-developed winter sports center and the latter is a noted hunting and fishing area, with an access road leading to a half dozen forest campgrounds.

In this group, too, is the Snake Range, Nevada's highest and considered by many to contain the finest mountain country in the state. More than eighty miles long, the top point is Wheeler Peak, 13,063 feet, which rises in one continuous sweep, 8000 feet above Spring Valley, to the west. Under the rugged crest on the east side is a series of high, glacier-carved basins which make an enchanting mountain oasis. The extensive spruce forests, cascading streams, alpine lakes, great cirques, and rugged peaks resemble a piece of the Colorado Rockies dropped by mistake in arid Nevada. At the east foot of the range is Lehman Caves National Monument, created in 1922 to preserve small but singularly beautiful limestone caverns, and nearby are two campgrounds from which good trails lead to the high country around Wheeler Peak. Further north is Mount Moriah, 12,049 feet, in a remote, little-known section of the range.

Rivaling the Snake Range, but scenically quite different, are the Ruby Mountains and their northern continuation, the East Humboldt Range, east of Elko. More than a hundred miles long, and eight to ten miles wide, the Rubys have a dozen peaks over 11,000 feet altitude, which rise impressively above deep, cliff-walled canyons and are separated by cup-like timberline basins, studded with sparkling lakes. A good road follows Lamoille Canyon far into the range and a skyline trail winds along the crest for a distance of thirty miles.

Seventy miles north of Elko is a five-mile row of rock peaks, topped by the Matterhorn, 10,839 feet. It dominates a mountain region of high ridges and forested valleys, which stretches along the Idaho boundary. Usually called the Jarbige Mountains, this area is crossed by several roads and is a favorite with hunters, fishermen and campers. Further west is another mountain recreation area in the Santa Cruz Range, north of Winnemucca.

With such a wealth and variety of high country it is surprising that Nevada's mountains are still generally so little appreciated. For more than a century the state has been a main transcontinental route and its vast mineral riches led to early exploration and settlement wherever strikes were made, even in the remotest mountain sections. Yet practically the only accurate descriptions of Nevada's ranges and records of mountain ascents were made by members of government surveys from the 1850's

to the 1880's. Most prominent of these were Clarence King's Geological Survey of the 40th Parallel, 1867-1879; a geographical reconnaissance of central and eastern Nevada under the direction of Captain George A. Wheeler in 1868 and 1869; and the Coast and Geodetic Survey's Nevada Series of Triangles, from 1878 to 1890.

The exhaustive reports, meticulous maps, and fine steel engravings of these early government mountaineers now rest undisturbed in seldom visited library stacks, but they contain records of first ascents of Nevada's highest summits and detailed descriptions of nearly every range in the state. Typical of the strenuous climbing involved in line of duty is the report of Captain A. F. Rodgers of the Coast and Geodetic Survey. In September 1876 he scaled Carson Cone, Pah-Rah, Corys Peak and Augusta Peak, "ascending the mountains through formidable fields and slopes of snow and ice." Again, in October 1882, his Assistant, William Eimbeck, reported snowdrifts ten to twelve feet deep on Wheeler Peak, and a temperature of 20 degrees below zero Fahrenheit. He stated that: "The high snowdrifts which covered the living tents to within a foot or two of the apex saved the party from freezing to death."

One of the few popular contributions to the meager Nevada mountain bibliography was made by John Muir, California's famous naturalist and student of glacial phenomena. In 1878 he accompanied the Coast and Geodetic Survey party and climbed Mount Jefferson, Troy Peak, and Wheeler Peak, finding strong evidence of Pleistocene glaciation. Muir wrote a series of letters to the San Francisco *Bulletin* about his trip, which later formed five chapters of the book, "Steep Trails," published posthumously in 1918.

But, on the whole, the mountains of Nevada have remained strangely neglected. So much so, in fact, that not until two years ago was the active glacier on Wheeler Peak discovered.* In 1882 Eimbeck described a permanent icefield in the mountain's great north cirque, and Ralph Kauffman of Baker, Nevada, suspected glacial movement there in 1928. But the existence of a true glacier was not established until Albert Marshall and I visited the hidden floor of the cirque in September 1955. After an exceptionally dry year, with little snow, we found névé, bergschrunds, crevasses, and active moraines exposed, and glacial action was readily apparent. True, the body of moving ice is small, its greatest di-

* Heald, Weldon F.: "An Active Glacier in Nevada," *A. A. J.*, 1950, 10:1, pp. 164-167. (In this report the suggestion was made to include the alpine section of the Snake Range in an enlarged Lehman Caves National Monument or a newly created "Great Basin Range National Park." The project has gained considerable momentum in Nevada and among conservation organizations.)

mension probably not exceeding 2,500 feet, but it is of more than usual interest as being, so far as is known, the only active glacier in the state. Also unique is the fact that it had lain unknown and generally unsuspected in its well-guarded cirque since white men first came to the region a century ago.

The gigantic rock basin in which the glacier lies is perhaps the most spectacular single feature in the mountains of Nevada. Bearing a strong resemblance to the celebrated East Face of Colorado's Longs Peak, it is deeper and more sheer-walled, and is one of the largest and most impressive glacial cirques in the United States. Steep cliffs rise on three sides and Wheeler Peak soars at the head in an almost perpendicular unbroken precipice, 1800 feet high.

Possibly Nevada's desert ranges will continue to be bypassed by serious mountaineers—perhaps rightly so. But one thrilling ascent I can postively guarantee: the party that tackles the loose quartzite of Wheeler Peak's tremendous north wall will undoubtedly find one of the most terrific rock climbs in the country.

Climbs in the New Zealand Alps

PETER ROBINSON

ON December 24, 1955, I arrived in New Zealand to take up a Fulbright Scholarship for the study of geology at the University of Otago, Dunedin. In Dunedin I was welcomed by our honorary member, Professor Noel E. Odell, who immediately took a warm personal interest in my activities. I was soon honored by membership in the New Zealand Alpine Club which enabled me to meet other climbers and take advantage of special opportunities and facilities for climbing. Thanks are due to the U.S. Department of State, U.S. Educational Foundation in New Zealand, and the University of Otago for the opportunity to participate in the climbs described.

My stay in New Zealand lasted until late May 1956, during which time I had two six-weeks climbing seasons in the Southern Alps as well as a number of shorter trips. During the second of these seasons I was joined by Dick Irvin who came to New Zealand on his way to the Karakoram. Another American Fulbright Scholar, Stephen Espie, also participated in a number of ascents.

1. Mount Conrad

While staying at the New Zealand Alpine Club's Unwin Hut near the Hermitage in early February 1955, I became acquainted with Brian Timmings, of Auckland and talked him into taking me up the Murchison Valley to climb Mount Conrad, a peak which interested me for historical reasons. To begin with, we had to walk twelve miles to Ball Hut because the road had recently been washed out. Next day we went straight across the two-mile width of the Tasman Glacier and descended the left lateral moraine for two miles to the junction with the Murchison Valley. We then hiked up the broad gravel flats of the lower Murchison. Five miles up from the Tasman junction lies the moraine covered snout of Murchison Glacier. A short distance below this, on the west side of the valley, beside the stream issuing from the hanging Onslow Glacier, is the newly constructed Steffan Memorial Hut. Some distance below the hut the Murchison River swings in against some vertical bluffs. Since the river could not be forded we had to climb over the bluffs, clinging to vegetation, and digging our feet into gravel and loose rock. It was frustrating because we could look out across two miles of easy gravel flats just in front of us.

We were away at dawn on February 10 up the horrible moraines of the lower Murchison Glacier. Five miles of this tedious labor brought us opposite Mount Conrad (8505 feet) on the Liebig Range. We climbed up moraines and snow-grass slopes to the edge of a little glacier on Mount Conrad. At this point Brian found himself assailed by some peculiar sickness, and generously insisted on waiting, while I pushed on to the summit by the easiest possible route. I ascended to the head of the little glacier and up a long scree slope onto the main south ridge. I was following the route of the second ascent and had now intersected the ridge which Conrad Kain and H. O. Frind used on the first ascent in 1914. Where the previous parties had climbed partly on snow, I found a dry ridge of rotten rock, and, except for one exposed step, there was no difficulty.

The first thing which caught my eye when I arrived on the summit was a low, man-made pile of rocks. Apparently this was all that remained of Conrad's seven-foot cairn.* Frind had been so impressed with this, that he immediately asked Conrad's permission to name the peak "Mount Conrad." It is said that Conrad introduced cairn building to New Zealand, but the high peaks are snow-capped and cairns cannot always be built. I recalled the scene in August 1953 when four of us made the second ascent of Mount Conrad in British Columbia, in a blowing mist and found the remains of another of Conrad's monuments which he built in 1933.

I had arrived at the top about 1:00 P.M. Far below I could see Brian. I jumped up and down and yelled loudly. Soon an answer came floating up from below, but later I found out that he had not seen me, and only by coincidence had he decided to yell. The view was extremely broad and could hardly be described in the space allowed here. One point of interest was the contrast between the Godley Valley to the east, a broad expanse of stream gravel running from the Godley Glacier down to Lake Tekapo, and the curving course of the Murchison Glacier to the west. The upper névé of the Murchison heads on the divide.

At three o'clock I rejoined Brian. He had stretched out on a warm slab, and wasn't feeling "crook" any longer. It had been such a pleasant, easy climb that I was sorry there was not time now for him to go up also. We had a race against darkness back down the glacier, and various wild boulder-hopping techniques were tried for speed. In the end we got off the glacier snout just before dark. After a day of rest at the Steffan Hut, we hiked the entire 21 miles back to the Unwin Hut in one day, avoiding the terrible Murchison bluffs by fording the river twice in the early morning.

* Conrad Kain, *Where the Clouds Can Go,* edited by J. Monroe Thorington, New York: American Alpine Club, 1935 (reprinted 1954), page 331.

2. The Southeast Ridge of Mount Tutoko

For four days in January 1956 seven of us lay huddled beneath an enormous bolder in the Tutoko Valley of the Darran Mountains, Fiordland, waiting for torrential rain to cease. It was an entertaining group to be marooned with. Gerry Hall-Jones and Lloyd Warburton, of the Southland (Invercargill) Section of the New Zealand Alpine Club, Niel Wales and Norman Griffiths, of Dunedin, Stephen Espie, of New York City, Dick Irvin of San Francisco, and myself.

On January 7, with the sky clear again, we moved upward through the damp jungle-like forest and over several thousand feet of dangerous snow-grass bluffs. Lloyd and I, with light loads, went ahead and reached Sam Turner's Bivouac Rock (5000 feet) about noon. Just across the valley rises the tremendous southern face of Mount Tutoko (9040 feet), the highest peak in Fiordland and, in the opinion of many, the most beautiful mountain in New Zealand. To the left are the diorite rock buttresses and walls of the Southwest Ridge which terminates in the Tutoko Valley about 1000 feet above sea level. In the center is the south ice face which looses avalanches onto the Age Glacier every few minutes. On the right is the long Southeast Ridge, our objective for a first ascent, with its three forbidding rock buttresses, terminating in a high col. Lloyd and I spent the afternoon searching for a route to this col over a series of steep, narrow snow ledges.

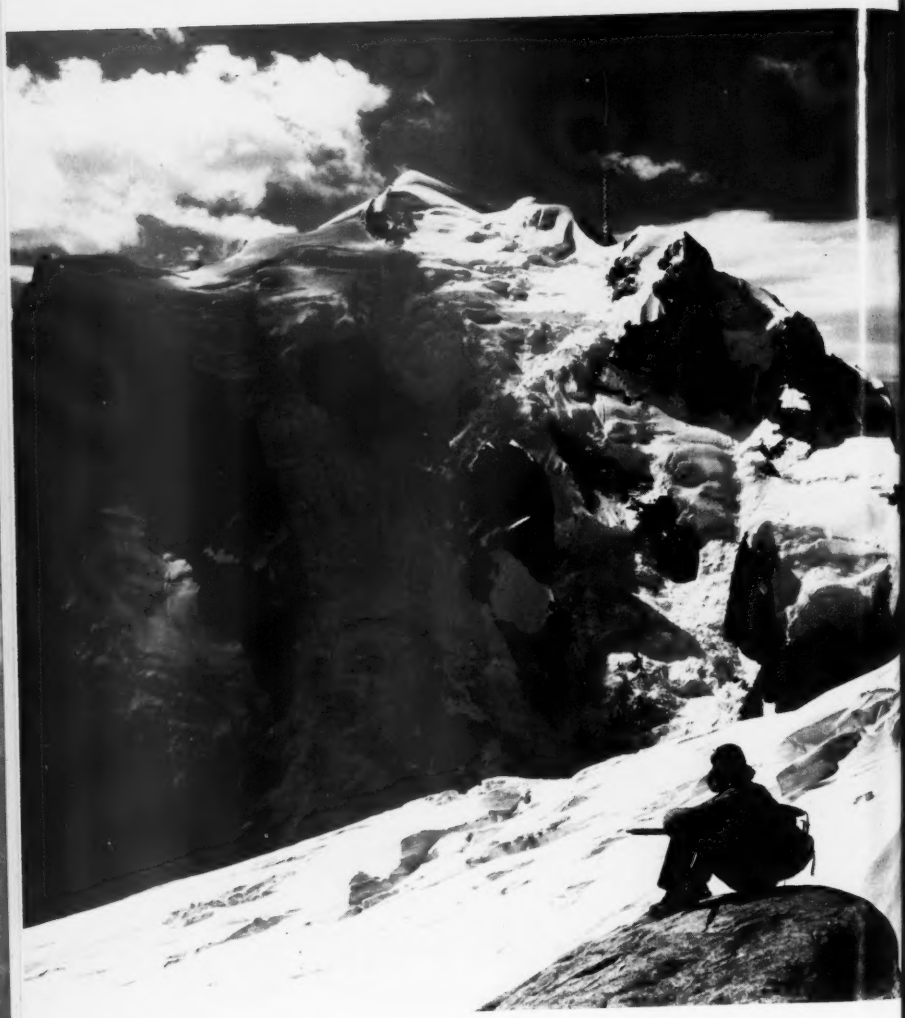
Back with the others at Turner's Rock, we saw heavy clouds again darken the horizon, but this was a false alarm, and the morning of the eighth was perfect. Gerry, Lloyd, Dick, and I started at 4:45 A.M. With excellent crampon conditions we quickly proceeded unroped around the steep slopes and up to the col at the base of the ridge, arriving at 7:40 A.M.

At the base of the first buttress Lloyd and I roped together, and I climbed gingerly across the moat between snow and rock. The rock was steep, firm, and very cold. One hundred and ten feet up a belay was found, and soon all four of us were working our way up a snow and rock ridge toward the second buttress. A fresh north wind blew mist over us occasionally, but was not annoying. Much to our surprise, the much-feared second buttress was climbed straight up easy rocks on the exposed lefthand side with "bomb-proof" belays behind two large rock needles. We arrived at the top of the second buttress at 10 A.M.

Things were going well, but now the last buttress at the top of a long, curving snow arête looked more forbidding than ever. At the base of the buttress Lloyd and I moved a few feet out to the left along the top of the snow. Lloyd secured himself around a large projecting block, and I moved up the wall, eager to test its possibilities. About 40 feet up I encountered

SOUTH ALONG CREST OF SPRING MOUNTAINS, NEVADA, FROM SUMMIT OF CHARLESTON PEAK. *By Weldon F. Heald.*

MOUNT COOK, from Glacier Dome. *By R. K. Irvin.*



MOUNT TUTOKO—Southeast Ridge at Right. *By R. K. Irvin.*

difficulties in a series of short overhangs. Eventually these were overcome, and I was able to move out onto slabs to the right and 30 feet up these to a small belay stance. Lloyd joined me quickly with the pitons, one of which was used to secure the belay. He then led up the remainder of the slabs and sent down the glad news that we were up the final buttress. He unroped and moved off to plug steps up the snow, while I sent down the rope to protect Dick's lead.

A few minutes later I was hurrying up Lloyd's steps to the crest of the ridge. His dim shape could be seen moving ahead through the mist, and shortly I was with him. From where we were, near the snow peak capping the last buttress, a narrow snow ridge swung gently downward to a col and then upward, sweeping to a magnificent "ladder to heaven" below the Southeast Peak. We put on the rope and crampons and set out along this without delay. It was a long, tiring stretch of step kicking, but at last we arrived on top of the unclimbed Southeast Peak. From this point Gerry, fulfilling a promise of the day before, took over step-plugging duties across a broad col and up a long slope to the higher peaks of the mountain.

We arrived on the southern bump about 1 P.M., and here had to decide through drifting clouds which of several peaks was the true summit. The narrow, corniced northern peak was proclaimed highest by all of us, and we strolled easily to it in ten minutes, thence returning to the rocks of the southern bump for lunch. If appetite is any indication, and I am sure it is, then I can say that rarely have I felt such great satisfaction upon reaching a summit. Fortunately for me, my friends' unmistakable enthusiasm was not reflected in the same way. Not much could be said for the view: occasional glimpses of glaciers, peaks, valleys, and the sea far below, with the continually shifting clouds around us giving an atmosphere of mystery and excitement not encountered on a clear day.

We were on our way down at 2:30 and reached the top of the last buttress in 45 minutes. Dick did a masterful job arranging pitons and slings for the 100-foot rappel to the snow below, and the rest of the ridges and the second buttress went easily. A second long rappel down the first buttress was very time consuming, but brought us back to the col at 6:30 P.M. The worst part of the day was the steep traverse of the snow ledges below the col, which were now soft and dangerous, as well as very much exposed. At last we reached a point where we could unrope safely and retrace the route Lloyd and I had used the day before. We enjoyed a spectacular sunset and rejoined the others at Turner's Rock about 9:15 P.M.

While we had been up Tutoko, Stephen and Niel had climbed Mount Madeline (8300 feet), the second peak of Fiordland. On the ninth, a

cloudless day, they went up Mount Syme, while we four traversed Madeline, obtaining magnificent views all over the Darrans and especially of our ridge on Tutoko. The rest of the sunlight hours we spent enjoying the scenic and sunbathing advantages of Turner's Rock with the 6000-foot ice- and rock-face of Tutoko as a backdrop and with thundering ice avalanches for entertainment. There is probably no more spectacular sight in New Zealand.

The descent of the snow-grass bluffs, which had been worrying us, was accomplished quickly on the morning of the 10th with the aid of ropes in two places. In the afternoon we pushed on down the Tutoko Valley over the rough forest track and about 4 P.M. reached Gerry's car on the road two miles from Milford Sound. From Tutoko Bridge the mountain loomed at the head of the valley almost a full 9000 feet above us, its upper ice set like a jewel in the black rock which rises sheer from the forest.

3. The North Buttress of Mount Aspiring

It had taken five days for Dick Irvin, Dr. Roland Rodda, and me to establish high camp at 7000 feet on the lower Northwest Ridge of Mount Aspiring. The first day we drove to Mount Aspiring Station from Lake Wanaka and hiked the twelve miles up the west branch of the Matukituki Valley to the Aspiring Hut (about 2500 feet). Jerry Aspinall, of Mount Aspiring Station, had been kind enough to bring most of our food in by horse. The next two days we carried loads from Aspiring Hut to French Ridge Hut (5200 feet). After a fourth day sitting out a storm at French Hut, on the fifth day we climbed up to the Bonar Glacier and crossed it to our high camp.

The main glacier systems surrounding Mount Aspiring, the Bonar on the south, and the Therma and Volta Glaciers on the north, are separated by the two main ridges of the mountain: the Northwest Ridge with its lower extension known as the Shipowner, on which we were camped, and the Southeast or Coxcomb Ridge. A lesser ridge, the Southwest, runs straight to the summit from Bonar Glacier. The Northeast Ridge or Surgeon's Spur rises steeply from the Therma Glacier and joins the Coxcomb some distance to the east of the summit. All of these four ridges had been climbed previously, the last, the Northeast, having fallen to climbers in 1955. Dr. Rodda, by careful study of the North Face seemed to have found the one remaining possibility for a new ridge-route on the mountain. From the tangled ice of the Therma Glacier a forbidding rock rib arches upward for 2000 feet directly to the summit. Dick and I came prepared with pitons and ready for serious difficulties on rock which has the reputation of being very rotten.

On January 19, 1956, we had breakfast at our high camp at 3 A.M., but soon it began to rain and continued until 8 A.M. the morning of the 20th. Thinking it too late to start for the big climb, we left for a reconnaissance of the North Face about 10:30, taking with us ice axes, crampons, but only one rope. Winding around and over crevasses on the Therma Glacier, we reached the base of the North Buttress about 1 P.M. Wishing to rub noses with the buttress a little, we started up the lower 700 feet of moderate slabs. There was a gusty wind coming across from the Northwest Ridge, which made the going unpleasant but kept us moving. The prospects for having another day of good weather seemed poor, and gradually we made up our minds to go on with the climb that day.

In 50 minutes we reached the top of the lower slabs, and Dick took over the lead from me. Above us rose the two steep 300-foot buttresses, one of which we knew would be the crux of the climb. As it turned out, the rock was mostly firm, the belays usually good, the exposure always immense, and the route just deceptive enough to keep the outcome in doubt until the very last. Our big regret was that we had only the one rope. Once or twice Dick and I had to climb together until he could reach a belay. At several points Dick found what was probably the only way up. The climbing had a certain semblance to both the Exum Ridge of the Grand Teton and the Northwest Ridge of Mount Sir Donald, but was more exposed than either.

Once above the second buttress we decided that I should continue unroped while Dick brought up Dr. Rodda. From here it was moderate snow- and rock-scrambling all the way to the summit rocks, just under the summit ice cone. While waiting I constructed a cairn to commemorate our ascent, and we had lunch there together about 4 P.M.

We put on crampons and rope for the summit, and I kicked and cut steps carefully upward. The peak itself was an uncorniced knife edge of rotten ice with an ominous-looking crack running the length of the crest. The wind was moderate, and we paused a few minutes for photographs. Of all the peaks to the south, Tutoko stood out most boldly, while the great mass of Cook dominated the northeastern horizon. No peak close to Aspiring has any significance at all, a fact that enhances the sense of altitude and isolation felt on the summit. Again we had the great experience of being able to look out over the sea from a high mountain top.

Like all previous parties we made our descent by the Northwest Ridge on easy snow and rock. We arrived back in camp in time to relax and gaze back at the sharp profile of the mountain as the last blood-red rays of sunset touched the top.

The next morning we could see that the weather was going bad. After a quick ascent of two minor peaks to get a head-on view of the North Face, we packed up and moved back to French Ridge Hut. After two wild nights of storm there, we descended to the Aspiring Hut and enjoyed a dinner of venison given to us by the local government hunters.

At the end of the twelve mile hike out to the road we enjoyed the warm hospitality of Mr. and Mrs. Jerry Aspinall, the owners of the famous Mount Aspiring Homestead. Here, 40 miles from the nearest town, at the Forks of the Matukituki River, we found New Zealand character and friendliness at its very best. Year in and year out they welcome climbers to their lonesome valley, and we hope that a few of those who come hereafter will enjoy repeating our route on the solid North Buttress of Aspiring.

4. The Bowie Ridge of Mount Cook

Good weather seemed to have arrived at last on February 1, 1956, and Dick Irvin, Hamish MacInnes, and I hurried back to the Haast Hut (6000 feet) below the Grand Plateau of Mount Cook. A few minutes before we rolled out of bed the next morning two New Zealanders arrived. They had completed their traverse of the High Peak of Cook via Earl's Route and the Linda Route in moonlight. Setting out ourselves at 3:15 A.M. behind two New Zealanders headed for the East Ridge of the Middle Peak, we worked our way up the familiar route onto Glacier Dome (8000 feet).

Once on the slope leading down onto the Grand Plateau, our spirits rose, and as we wound our way unroped through open crevasses toward the Linda Glacier, Hamish led us with a song. The sparkling moonlit ice walls of Mount Tasman echoed the words:

On Mount Joy one Monday morning
High upon the gallows tree,
Kevin Barry gave his young life
For the cause of liberty.

This day was to be a festival of unroped climbing. I shall never be sure whether we did the right thing, but I doubt if a roped party of three is likely to repeat our climb.

From the High Peak of Mount Cook (12,349 feet) the North Ridge leads down to Green's Saddle, which separates Mount Cook from Mount Dampier on the main divide. On the east side the Zurbriggen Ridge descends over 5000 feet to the Grand Plateau, separating the North and East Faces. Part way down the Zurbriggen Ridge a jagged, buttressed ridge separates itself northward toward Mount Tasman. This confines the Linda Glacier to a northward course from the North Face of Cook until it breaks

through a tremendous cleft and plunges chaotically eastward onto the Grand Plateau. Our objective was to make a first ascent of this ridge.

By sunrise we had crossed through the lower Linda Glacier and put on the rope to negotiate one of the most enormous crevasses we had ever seen. In order to avoid the huge lower buttress of our ridge, we worked up a small glacier and climbed onto the rocks of the east flank. Hamish led a difficult 100-foot pitch from the ice onto the rock, and we scrambled the remaining 1000 feet to the crest of the ridge.

Above us towered the second buttress composed of solid, reddish graywacke. The climbing on it proved to be mostly grade 3 to 4, with plenty of holds but few belays. We proceeded quickly "unroped together." About 200 feet below the top the moderate climbing ceased temporarily, and I belayed while Hamish made a fine lead up a thin, exposed crack.

From the top of the big buttress at 10:20 A.M. we proceeded toward five sharp gendarmes which we expected would give us some difficulty. But there turned out to be a fairly reasonable route through them. Easy scrambling brought us up the small final buttress to the junction with the Zurbriggen Ridge at 12:25 P.M. A new route on Mount Cook was ours. We decided to name it for Chief Guide Mick Bowie, who has done many fine ascents in the region, and who is always a generous friend and advisor to all serious climbers in the district.

We put on crampons for the mixed rock- and snow-ridge ahead, and soon I found myself far ahead of Dick and Hamish. Over on the East Ridge of the Middle Peak two black dots could be seen moving slowly upward. Mount Tasman gradually sank below the horizon, and more of the Tasman Sea came into view. To the northeast the Tasman Glacier looked like a flat monster with tentacles reaching to every peak. All other peaks seem to lose significance when one is on Mount Cook.

At the rocks below the summit I rested 30 minutes until Dick and Hamish caught up, then relinquished my seat to them and continued kicking steps up the final 900-foot icecap to the summit. How fortunate we were to have such a day to be on top of New Zealand. It was so clear that one could see the Pacific Ocean on the far side of the South Island. Our hopes of doing a grand traverse of Mount Cook were quickly disposed of, for the whole southern ridge was sheathed in rock-hard green ice into which crampons would hardly bite.

After we had all been on the summit about 30 minutes we heard a whoop. Soon the guides, Phil Boswell and Gavin Harper, arrived, with Tony Luytens. They had come up Earl's Route from the Empress Hut (8000 feet) on the upper Hooker Glacier. This was the first time in history

that two parties had met on the summit of Mount Cook! We were of five nationalities: New Zealand, Australian, English, Scottish, and American.

We inquired of the guides if it would be feasible for us to descend Earl's Route. They told us the angle was moderate and we would have their steps to follow. This proved to be very bad advice. Soon after leaving the summit at 4:30 we found ourselves on a 45 degree slope of green ice with projecting rocks. If we had been thinking clearly we would have climbed back and gone down the Linda Route. The steps were very small and far apart. Hamish's steel-handled ice hammer, which he used in lieu of an ice axe, proved to be the only thing which would penetrate the ice. Dick went down first finding rocks for belays.

After several hours we got below the hard ice and were able to scramble unroped on easy rocks with small patches of snow or rotten ice. At one point I cramponed down onto a patch of rotten ice. Realizing it was not as solid as expected, I turned inward to plant the pick into the surface. Just as the pick struck the ice, both feet broke out from under me. I was in self-arrest position before I had slid more than a foot, and expected to stop immediately. Instead I found myself accelerating. Beneath about two inches of rotten stuff the ice was hard as rock. I became annoyed with myself, for I knew there was a 2000-foot precipice not far below. I was to be an object lesson for unroped climbers. This was the end, but at least I would go down fighting. Every particle of energy was applied to the axe. The slope lessened, and the effort seemed to be succeeding, for my speed decreased until I was moving slowly. But try as I would I could not stop. Now death was flirting with me before the final doom. I bumped over the first rocks. The precipice was near now. Suddenly I was no longer moving, and only the loose ice continued to hiss downward. Contrary to my training, I had been digging in my feet with crampons on and these had caught on some rocks to stop me. Twenty feet below was a small drop, and 100 feet beyond that was space. I had fallen 300 feet. I shouted to Dick and Hamish that I was unhurt and then became much annoyed because I had lost my sun goggles and my watch.

In the evening sun we scrambled down over more rotten rock with waning hopes of reaching the Empress Hut that night. We stopped in a little cave at about 10,500 feet at 9:00 P.M. Putting on all the clothing we had, we sipped a little trickle of water and ate. Hamish and I wedged ourselves together between two rocks for warmth, and Dick curled up a foot or two away.

We started down again at dawn and reached the Empress Hut in about three hours, after a very unpleasant time getting from the rock onto the

glacier. There was plenty of food besides what we had brought over the top, and soon we were having an orgy to be followed by long sleep. I was often contemplating what it meant to be alive.

In the early evening there came a knock at the door, and our two friends from the East Ridge of the Middle Peak came in. They had made the Middle Peak very late, but had been stopped by the green ice of the high peak just before sunset. They dug an ice cave at about 12,000 feet to spend the night, and took all of the next day coming down from the Middle Peak into the Hooker Valley. All of us can be thankful there was no storm that night. They soon left in order to reach the Gardner Hut before dark.

We left Empress Hut about noon the following day and descended the Hooker Glacier via Gardner Hut, Pudding Rock, and the Hooker Hut. Fourteen miles and seven hours later we reached the Hermitage. From here Hamish ferried us two miles down to Unwin Hut on his motorcycle. For the next five days there were violent storms, and we had plenty of time to think over our experiences before the next climb.

Summary of Statistics

AREA: Southern Alps of New Zealand.

ASCENTS: Conrad, 8805 ft., February 10, 1955: Peter Robinson.

Tutoko, 9040 ft., first ascent of Southeast Ridge, January 8, 1956: Peter Robinson, Richard K. Irvin, Lloyd Warburton, Gerry Hall-Jones.

Madeline, 8300 ft., January 9, 1956: Robinson, Irvin, Lloyd, Hall-Jones.

Aspiring, 9957 ft., first ascent of North Buttress, January 20, 1956: Robinson, Irvin, Roland Rodda.

Cook, 12,349 ft., first ascent of Bowie Ridge, February 2, 1956: Robinson, Irvin, Hamish MacInness.

A Middle-Aged Mountain

RICHARD N. MEYER

SOME mountains seem particularly ancient, austere, and noble. Others seem hard and young and defiant. But in 1955 I ran across a mountain which I can only think of as middle-aged. The glittering array of snow- and ice-fields which had once adorned this peak and the surrounding ridges have withdrawn in recent years, leaving gleaming miles of balding granite surfaces. One stormy February day, some 25 years ago, the upper part of the sharp tooth-like summit-ridge collapsed into the valley, lowering the peak by fifty feet. Once a challenging ascent in its own right, today it is more of a landmark which German and Austrian tourists traverse en route from one alpine club hut to the next. I refer to the Ankogel, in the High Tauern range of Austria.

For several years prior to 1955 I was living in places too remote from the mountains to permit of any climbing. During this time I built up my modest library of alpine literature and became perforce an armchair mountaineer. These were difficult and exhausting years for the sedentary expert. Following the French success on Annapurna the great eight-thousanders yielded one by one. I suffered in print the agonies of frozen, gangrenous extremities with Maurice Herzog; I dragged myself on hands and knees through the bitter lunar landscape of the South Col; I shared the awful loneliness of Hermann Buhl's bivouac below the summit of Nanga Parbat. Finally, reaching the limits of endurance, I determined to seek refuge in a modest mountain expedition myself. In 1954 my work had taken me back to Europe, so the mountains were available.

The next step was to find the right mountain, the two major factors being accessibility and—let us face it—ease of ascent. I was not seeking out unclimbed north walls, but a respectable peak of medium height, reasonably interesting, and, human nature being what it is, not totally unknown. My armchair years came to my aid. From the depths of my memory there emerged the name "Ankogel."

In the 1890's the great English mountain-climber, Sir Martin Conway, conceived the original idea of traversing the whole chain of the Alps from the Maritimes, in France, to the Tauerns, in Austria. He recorded his tour de force in an alpine classic, "The Alps From End to End." The Ankogel

is the eastern "end" of this title. It is 10,670 feet high, surrounded by snowfields and small glaciers, and boasts an airy summit ridge.

Since my visit to the Ankogel I have reread "The Alps From End to End," and I am somewhat surprised that Sir Martin should have ended his epic tour on the Ankogel. For to the east of the Ankogel there looms a higher, icier, and in every respect more impressive summit, the 11,010-foot Hochalmspitze. Conway, however, calls the Ankogel "the last of the snowy alps." He admits that "the Hochalmspitze does indeed jut out beyond it to the southeast and is slightly higher, but is a mere buttress point." I suspect that Sir Martin simply got fed up with slogging through the Alps in one of the coldest, rainiest summers on record, and suddenly decided to call it quits. No doubt his Victorian sense of orderliness impelled him to rationalize just a bit.

The Ankogel lies above and to the east of the great Tauern railroad tunnel, which burrows more than five miles through the range from Bad Gastein at the northern end to Mallnitz at the southern. This is one of the loveliest parts of Europe, and whether you approach the Ankogel from the north or from the south you cannot avoid traversing interesting and beautiful country.

Bad Gastein is an old and famous resort with huge palace hotels tumbling over each other in the narrow valley. Gastein enjoyed its heyday in the nineteenth century. Its waters were reputed to have rejuvenating properties, and the ultra-smart Austrian court nobility used to descend on Gastein with eagerness before the opening of the imperial social season in Vienna, and then drag themselves back for a cure after the season had ended.

By contrast Mallnitz, on the south side of the range, is a quiet Austrian alpine village lying among green meadows in a broad valley. Over the Labor Day weekend of 1955 my wife and I drove through the old Ausrian province of Kaernten and up to Mallnitz. Ruined castles looked down from the hilltops on ancient towns, and snowy summits looked down on the castles.

I never like solo climbing on a strange mountain, be it ever so easy by reputation, so I set about finding a guide in Mallnitz. After considerable effort I located an old man of seventy, who seemed to be the last guide left in the valley. Old Johann was mightily surprised that anybody should want his services as a guide, particularly on the Ankogel. He maintained his composure, nevertheless, and, claiming that even one day away from his harvest (we found him cutting grass along the highway) would spell economic ruin, persuaded me to offer twice the usual fee for the Ankogel. It still

wasn't very much, however, and we arranged to meet Johann up at the Hanover Huette that evening. The Hanover hut is one of the older cabins belonging to the Austrian Alpine Club. It is airily situated on a big spur of the Ankogel at 8800 feet.

We drove our car up a convenient little valley above Mallnitz, parked it overnight at a rustic inn, and set off for the Hanover hut. It was early afternoon, the sun shone, our peak was just visible behind a nearer ridge, while the Hochalmspitze dominated the end of the valley immensely. Before us stretched the pleasant prospect of a leisurely afternoon's ramble through pine woods and alpine meadows.

At this point I almost wrecked our little expedition before it got started. It has long been understood in our family that, while I may be incapable of driving around a city block without advice and guidance, in the mountains my keen alpine instincts render me omniscient and unerring. This was the first time I had ever been able to persuade my wife to accompany me into the Alps. The main selling point was the unique beauty of the easy, unhurried ramble through lovely alpine meadows to the cabin. There were two paths leading from the inn where we left our car. Without the slightest hesitation I chose the wrong one, following it for a whole hour before a peculiar feeling in the pit of the stomach warned me that something had gone wrong. We had walked up a flat valley into a cul-de-sac. There was nothing for us but to reverse our steps and walk back another hour. Two hours behind schedule, knowing we should not make the cabin before dark, wondering whether to go on! Make it we did, however, with a borrowed flashlight, tired and worried. Old Johann, in comfortable slippers, came out to meet us as far as the front porch. He was unperturbed by our alarmingly late arrival in darkness and fog, but he was a nice old gentleman and made us feel right at home. I was somewhat consoled to read later that Conway, too, had lost his way, and in exactly the same manner, approaching the Hanover hut from the other direction sixty years earlier.

Conway devotes a sentence and a half to the actual ascent of the Ankogel: "We . . . followed the path to a little glacier. A scramble up the slippery ice, and an easy rock-arête above it, brought us in an hour and a half to the top of our peak . . ." I have nothing to add; that is the ascent of the Ankogel. Except that it took us a little longer, because Johann had not been up a mountain in ten years and tired easily.

We had started out at dawn, as if the goal had been Monte Rosa. We were rewarded for our eagerness by having the summit all to ourselves for a whole hour in the golden early morning sun. The Grossglockner, Austria's highest mountain, dominated other Tauern summits in the west. On

the other side, close by, the Hochalmspitze glittered superciliously. To the south Triglav, in Yugoslavia, loomed darkly. Odd corners and angles of the Dolomites were visible. This impressive view was strictly for the early bird, for clouds soon started up around the horizon. As we set off down the ridge we could not forbear commiserating just a little with the ascending parties (all guideless) over the rapidly disappearing panorama.

Sir Martin didn't think much of the view from the Ankogel. Disappointing, he called it. A few days earlier, complimenting the fine view from the summit of the Grossglockner, he had stated ponderously that "no near intrusive mass disturbs the progress of the circumambient eye. Probably the Ankogel's easterly buttress, the Hochalmspitze, kept intruding itself uncomfortably on his circumambient eye. Baedeker agrees with me, calling the panorama "very fine."

I look back with warmth on my brief acquaintance with the Ankogel. This expedition involved only slight physical effort, no hardship, no glory. It was a walk plus a scramble. One would hardly urge A.A.C. members to include the Ankogel in their European itinerary. And yet this return to the Alps revived unchanged all the old familiar and unique pleasures. The high meadows with the tough little alpine flowers; the warm, smoky evening of good talk in the mountain cabin; the alpine sunrise and the quiet moments on the summit; the feel again of snow and rock; the surprising views of nearby peaks when seen from the upper levels rather than from the valley below. All of these wonderful experiences belong to all mountains, differing in degree rather than in kind. Even when the mountain stands at the opposite end of the scale from the august eight-thousånders that are making most of today's mountaineering news.

Well, the Ankogel may be a middle-aged mountain, but it is still an awfully nice mountain for middle-aged mountaineers!

Rakaposhi - Almost

RICHARD K. IRVIN

OUR Dakota circled once over Rawalpindi and headed north with nose up, straining for altitude. Below now lay the Sind desert, and far behind was Karachi with its uncountable government offices, each with its interminable delays for permits. Somewhere in the distant past, also, were the hundreds of letters, the begging for supplies and equipment, the packing and shipping, and the dreaming. Now we were here at last. I looked out the window. Ahead rose the steep, blue ridges of the Himalaya, crest above crest to the Babusar Pass. Beyond, I knew, were the Indus Gorge and Nanga Parbat and Gilgit—and Rakaposhi.

I looked around the inside of the plane: down the middle there was a great mass of boxes, bags, sacks, and crates, parcels of every shape and size, all held in place by a tight cargo-net. Scattered around the perimeter of the cargo were about a dozen people, three of whom were my fellow expedition members. Bob Swift and I had been climbing together in California for several years. He is tall, strong, a good diplomat. Most of his experience had been on rock. Hamish MacInnes dozed against the wall—right in character, I thought, for Hamish is usually either eating or sleeping. Hamish learned climbing in his native Scotland with the infamous Creagh Dhu Club. He moved into the Alps at an early age and later went to New Zealand where his antics gained him a certain measure of notoriety. He was the only Himalayan veteran among us; he had attempted Pumori, in Nepal, in 1953. Mike Banks, a captain of the 42nd Royal Marine Commando, is an old friend of MacInnes'. He was busy with a map and the view, his head going around like a spectator's at Wimbledon. Mike had done the least climbing of our team, but he had backed up his alpine experience by two expeditions to Greenland. Mike was elected leader of our foursome on the basis of greater age, thirty-two, and because of the fact that he was the only one of us whose dignity was enhanced by employment. Hamish, Bob, and I each passed our 26th year while in Pakistan.

We skimmed over the pass between little rocky peaks of about 16,000 feet. Ahead on our right was Nanga Parbat, indescribable—but, "no

photographs, please." We huddled over the map. "There's Haramosh, that's the Karakoram now!" There were mountains everywhere, all immensely spectacular in the clear morning air. All of them looked unclimbable, excepting Nanga Parbat: fair enough, I thought; it's the only one that's been climbed. Rakaposhi showed itself for a moment, and then we were coasting into Gilgit. It was a good landing on a clay field with a difficult twisting approach. Captain Fazl I-Haque was waiting for us. He had been assigned to our expedition by the Pakistan army as liaison officer. Fazl was young (24) and slight; and totally inexperienced as a mountaineer, not an enviable circumstance when one is going to Rakaposhi.

We jeeped to the Political Agent's residence, where introductions were followed by luncheon and the allotment of three large rooms for our comfort. We had scarcely finished checking our bags and boxes when the porters arrived: four scruffy, healthy characters sent by the Mir of Hunza. They were led by Isa Khan, a veteran of the successful expeditions to both Nanga Parbat and K2. Isa Khan is a strong and capable leader, and a skillful mountaineer as well. Qambar had been to the Batura Glacier with Rebitsch in 1954 and was said to have killed many men in the Kashmir dispute. He is big and possessed of prodigious strength, but seemed to have altitude trouble. Nadir Aman was young and inexperienced, but he was strong and willing, and he did more than his share of the undesirable tasks. Dilap Shah was also inexperienced. He was older than his fellows by many years, and we were somewhat reluctant to take him on, but we decided to do so as the others assured us he was a strong hunter. In the event Dilap was a very willing worker and proved to be the strongest on the difficult carry between Camp II and Camp III. I felt that our four porters were very good, and I would gladly take them again.

Our next day was an active one, to say the least. Kerosene and food for the porters had to be purchased, the porters' equipment was issued, and everything was loaded into three jeeps and trailers supplied by the Northern Scouts. After an excellent lunch with the Political Agent our ever-increasing entourage climbed into the three jeeps, and we were off for Nomal, 17 miles up the Hunza River. Besides the four of us and Fazl, there were now a police inspector and a tasildar. The tasildar had a cook and an orderly. What with drivers and assistant drivers and the baggage, we were fairly crowded, but it was nothing compared to the 20-passenger loads that customarily careen around Gilgit. For half the distance to Nomal the road follows along the elevated river bank, and there are no difficulties except an occasional stretch of soft sand. Then,

where the river swings to the west, the road climbs up on the cliffs and for a few miles provides the most spectacular drive I have ever experienced. We climbed and dived, twisted and turned; we edged around corners and crept along ledges. Time and again our driver dropped neatly into low-range low gear a split second before we stalled—a maneuver that Bob and I admitted we would not like to try on that road. In the late afternoon we rolled through Nomal and into the rest-house compound. By dark all the supplies had been moved down to the river, and most of them were across. We had gathered at Matum-das, the town on the Rakaposhi side. The river crossing was executed by means of a zok—an inflated skin—and bamboo-raft—piloted by a Hunza version of the Ancient Mariner. The crossing was rendered doubly exciting by the uncertain durability of the raft itself.

At Matum-das we exchanged our coolie team for another and moved on to Jaglot, where we executed our third and last coolie change-over. We followed the Jaglot Nullah away from the Hunza Gorge to Darbar, which is an uninhabited meadow below the snout of the Biro Glacier. A good trail continues around the terminal moraine of the Biro and up through the last pines to the outwash plain of the Kunti Glacier. We then followed up the true right bank of the Kunti Glacier to the base-camp site, a grassy little shelf at 14,000 feet. We had arrived at Base Camp completely intact in just four days from Gilgit; surely one of the shortest march-ins of Himalayan expeditions.

This is the southwest corner of Rakaposhi, whose summit is triangulated at 25,550 feet, and our base camp was the same as that used by at least two of the five previous expeditions. The area is bounded by two immense ridges, the southwest and the northwest. The Kunti and Biro glaciers lie between these two ridges with a common drainage down the Jaglot Nullah, and they are separated by the relatively short southwest spur ridge. The southwest spur abuts against a steep dome of ice known as the Monk's Head, and the Monk's Head is connected to a col at 21,000 feet on the main southwest ridge. It had been assumed by all previous parties that if one could reach this col, the way to the summit was open and easy. And so it appears.

Conway's expedition of 1892 was the first to come to Rakaposhi.* It made a brief reconnaissance of the approaches and moved on. In 1938 came Secord and Vyvyan, who concentrated on the northwest ridge and reached a small peak of 19,700 feet, which was cut off from the upper

* William Martin Conway, *Climbing and Exploration in the Karakoram-Himalayas*, London, 1894; "Climbing in the Karakorams," *Alpine Journal*, August 1893, vol. 16.

part of the ridge by a steep descent.† Tilman and Gyr were on the scene in 1947; they also climbed the 19,700-foot peak and agreed with Secord and Vyvyan.‡ From the Kunti Glacier camp they reached the southwest spur and climbed along it until they came to a 19,500-foot gendarme. This they climbed "with difficulty" and gazed across the half mile gap to the Monk's Head. Tilman is said to have muttered "Hopeless! Hopeless!!" They returned to the northwest ridge, on which they managed to ascend to the crest beyond the descent from Secord's peak. However, they judged the route too difficult for laden porters. In 1954 two more expeditions arrived. The first, a German-Austrian party under Rebitsch, was quoted as saying that any possible route was either too difficult or too dangerous.§ The second group, a party from Cambridge University, led by Tissières, climbed once again the 19,700 foot peak, then shifted to the Kunti Glacier camp and climbed onto the southwest spur in force.‖ They crossed the Gendarme and placed a camp at the foot of the Monk's Head, then climbed the ice slope to the shoulder at about 20,500 feet. They were turned back from the mountain by weather before any supplies could be carried up. As the route taken by our predecessors seemed to be the best, if not the only, route, we planned to go direct to the Kunti Glacier Base Camp and push up along the southwest spur without any preliminaries.

The British-American Karakoram Expedition arrived at Base Camp on May 27 with 57 loads of food and equipment, and the work began immediately. It's just a talus walk up to Camp I, at 15,500 feet, and when we were acclimatized it was done easily in an hour. No one stayed at Camp I; it was used only as a storage depot while loads were being relayed up the couloir to Camp II. The couloir was snow-filled, twisting and steep. There was some danger of rock fall or avalanches when it was snowing, but it wasn't too bad if the trip was done quickly on the hard early-morning snow. Camp II is at the head of the couloir, just off the crest of a 17,300-foot saddle on the southwest spur. Bob, Mike, and Hamish moved into Camp II on June 5, and on the 6th, three more loads got through as the weather closed in.

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† Campbell Secord and Michal Vyvyan, "Reconnaissances of Rakaposhi and the Kunyang Glacier," *Himalayan Journal,* 1939, vol. 11. Michal Vyvyan, "A Journey in the Western Karakoram," *Alpine Journal,* November 1939, vol. 51.

‡ H. W. Tilman, Two Mountains and a River, Cambridge, 1949; "Rakaposhi," *Alpine Journal,* November 1948, vol. 56.

§ Matthias Rebitsch, "German-Austrian Karakoram Expedition 1954," *The Mountain World,* 1955.

‖ George Band, *Road to Rakaposhi,* London, 1955. Roger Chorley, "To the Monk's Head on Rakaposhi," *Alpine Journal,* May 1955, vol. 60.

It snowed then for several days, during which time the only accident occurred when I tried to get through to Camp II but was forced to give it up. I left my load in the couloir about a thousand feet above Camp I. On June 12 a big avalanche came down the couloir carrying away the load I had cached. The equipment lost was vital, but then everything we had was of the same category, and anyway, it melted out a week later near Camp I. On June 13 I got through to Camp II with the porters, and we were moving once again.

Above Camp II the route follows snow slopes for a thousand feet, then traverses upwards across moderately steep ice to a point at 18,700 feet on the end of the southwest spur. We hacked out across the ice a continuous ledge which became known as "The Road to Rakaposhi." Beyond Point 18,700 the ridge dips past the Cambridge expedition's Camp III at 18,600 feet to a low at 18,400 feet, then climbs with continuous cornices to our Camp III at 19,200 feet and to the Gendarme at 19,500 feet. On June 15 we moved Bob and Mike to the old Camp III, which is fairly spectacular: indeed, I see by my diary that I described it at the time as a stone platform built on a cornice. Bob and Mike moved their camp to the 19,200-foot site the next day, and on the 17th Hamish and I carried loads to that camp while Bob and Mike explored over the Gendarme. All this time the porters had been plodding up and down the couloir, with the result that Camp II now had food and fuel sufficient for over two months—if you didn't mind what you ate. The porters were due to move up to Camp II and to seven rupees a day, but the night of the 17th brought snowfall, and the whole operation slid to a halt.

Ten days later the storm came to an end, and Bob and Mike, having eaten their week's supply of food, returned to Camp II. The following day Hamish and I re-occupied Camp III, supported by Bob and Mike, while the porters moved up from Base—and we were back in high gear. The Gendarme is a major obstacle in the ascent of Rakaposhi; enough food and equipment must go over it to provide four more camps beyond, and it is too difficult for even the best Hunzas. Leaving Camp III the route traverses an ice slope, then climbs steeply up to a line of rocks which roughly marks the cornice. These rocks were followed along to the top of the Gendarme, a very narrow and exposed summit. On the far side a snow slope drops away for a hundred feet, levels off, then plunges three hundred more at an alarming angle to a small col. Beyond the col our route passed through a large schrund to reach the miniature glacier-basin below the Monk's Head, the site of Camp IV. With fixed ropes and bucket steps the Gendarme could be passed rather quickly, and

RAKAPOSHI—From Camp III looking down on Camp II. *By R. K. Irvin.*

RAKAPOSHI—The Summit, from Cornice Camp, between Camps II and III. *By R. K. Irvin.*

by carrying two loads a day we were able to establish Camp IV with all hands on July 3. Camp IV was on a gently inclined snow shoulder overlooking the little basin and the Monk's Head above it. It was, like Camp III, at 19,200 feet.

We began immediately on the Monk's Head, cutting steps out to the ridge on the western extremity of the great ice face. The ridge was not overly steep, but resting places were few—only those we cut. We climbed mostly on crampons to avoid chopping steps, and a fixed line was attached until we ran out of it. At 20,000 feet there was a flat resting spot on top of a little ice cliff, and a short distance above was a tricky corner to go around, out from under another ice barrier—places we would long remember after the descent. At 20,500 feet we came out onto the gentle snow slopes leading up to the Monk's Head summit. We had thought it best to traverse along the corridor side of the Monk's Head to avoid the double descent involved in following the crest to the 21,000-foot col on the main southwest ridge, but the slopes proved to be exceptionally steep (70°+) and we were forced onto higher ground. Our first carry fell short of the Monk's Head crest by about 100 feet when an afternoon snowstorm got out of hand; but the second try succeeded in placing loads at a roomy campsite on the col—I called it "Corridor Col." (The Corridor is that part of the Biro Glacier which makes a right-angle bend around the Monk's Head and lies in the slot between the Monk's Head and Rakaposhi, forming a possible but very dubious route to Corridor Col.) The climb to Corridor Col was a very tiring affair, for, although the difference in altitude between camps was only 1800 feet, there was an additional 400 feet of descent to be added in. We all took a complete rest day before carrying our personal gear to establish Camp V at 21,000 feet on July 8. We had about 10 days' food and fuel, but due to an oversight there was no potato powder—all the more regrettable in that we had been existing mainly on that item.

We had decided at Camp IV that it would not be possible for only four of us to place more than two camps above the Monk's Head: the first, our present Camp V, to be on the Corridor Col, and the last, Camp VI, to be as high as possible. We had thought that, as the climb was presumed to be easy beyond that point, we could place Camp VI at 23,500 feet, or hopefully, at 24,000 feet, by means of one hard carry. So it was with dismay that we discovered that the angle of the broad ridge above Corridor Col was just as steep as the Monk's Head below. About 800 feet above the Col the angle lessens considerably while travel becomes menaced by crevasses; then the ridge narrows and steepens gradually to culminate

in an exposed ice arête leading to a level platform at 23,000 feet. When we reached this platform about four hours after leaving Camp V, the weather had deteriorated. It was now snowing, and as Bob and Mike had to descend to Camp V it was decided to place Camp VI on the platform. The tent was erected, and Hamish and I were left with three days' food and fuel, one stove, one pot, and one tremendous view. The horizon, unencumbered by Rakaposhi's last 2000 feet, extended over about 260 degrees of arc, from the direction of the Baltoro Peaks, south past Nanga Parbat, and around by the Hindu Kush as far as the Batura peaks. Unfortunately, Disteghil Sar and other Hispar peaks were hidden behind Rakaposhi.

The earth turned eastward into darkness, and at Camp VI Hamish and I began our first night at 23,000 feet. I awoke suddenly and tried to focus my eyes on the luminous dial of my watch. I read ten minutes to four. With great effort I peered out at a clear and beautiful night, determined that the weather was good, and collapsed back into my sleeping bag. A short time later I again checked my watch, only to discover that it was now ten past twelve! I made no attempt to analyze this phenomenon —it was easiest to accept as the correct time whatever the eyes and watch might indicate at any given moment. Dawn arrived at last, and with very little mental strain Hamish and I determined that today would be a repetition of the previous day weather-wise. As afternoon snow would push the summit rocks into a realm beyond our ability, no reason could be found to attempt the upper reaches of the mountain that day. We went back to sleep, and the day, of course, was perfect.

Shortly after noon Bob and Mike, who arrived from Camp V with their sleeping bags and a little food, were as surprised to find us in camp as we were to see them on this day. Our two-man tent withstood the afternoon conversation and dinner; then somehow we all managed to stretch out for the night. At 3 A.M. I announced the hour and raised up to a sitting position, only to be greeted by a gruff voice proclaiming 3:30 as the appointed time—the voice belonged to the same individual who had been most adamant for a 3 A.M. rising. At 3:30 I began "cooking" breakfast while the others dozed; then, at 5:30, we found ourselves out in the pre-dawn cold making final adjustments for the climb. The morning was brilliantly clear and terribly cold, with a strong wind which cut through our windproofs and could not be faced directly. We began climbing roped together, the only time I think that we were all four on one rope, and first surmounted a very steep rise just above Camp VI. The sun rose out of the dust, and the Karakoram spun itself into gold—below

us there was only the dark world of man—and far away to the east we could see a shadow of a great mountain, so high it could only be K2. We threaded our way through a crevasse system on the second try, then found at last that the slope was open and easy. Hard snow gripped our crampons, and the angle was pleasant. Above us the snow was broken down the middle by a ridge of rocks projecting only a few feet above the snow and running all the way up to the plateau. This we christened the "Lizard's Tail," and we made our way towards it. As 8 A.M. came we arrived one at a time at the Lizard's Tail. The first 500 feet above Camp VI had taken 2½ hours, and it was still 2000 feet to the summit. We discussed our situation, which, although a complex one, had several clear points: it was very unlikely that anyone could reach the summit that day without a bivouac during the night, and no one wanted to spend another night with four at Camp VI. Also, there was not enough food for another full day of four men at Camp VI. But I think it was the talk of frostbite that finally decided us to turn back—and a cold, strong wind that was cutting us hard. We gazed up the Lizard's Tail from 23,500 feet, the highest any of us had ever been, then turned and started down.

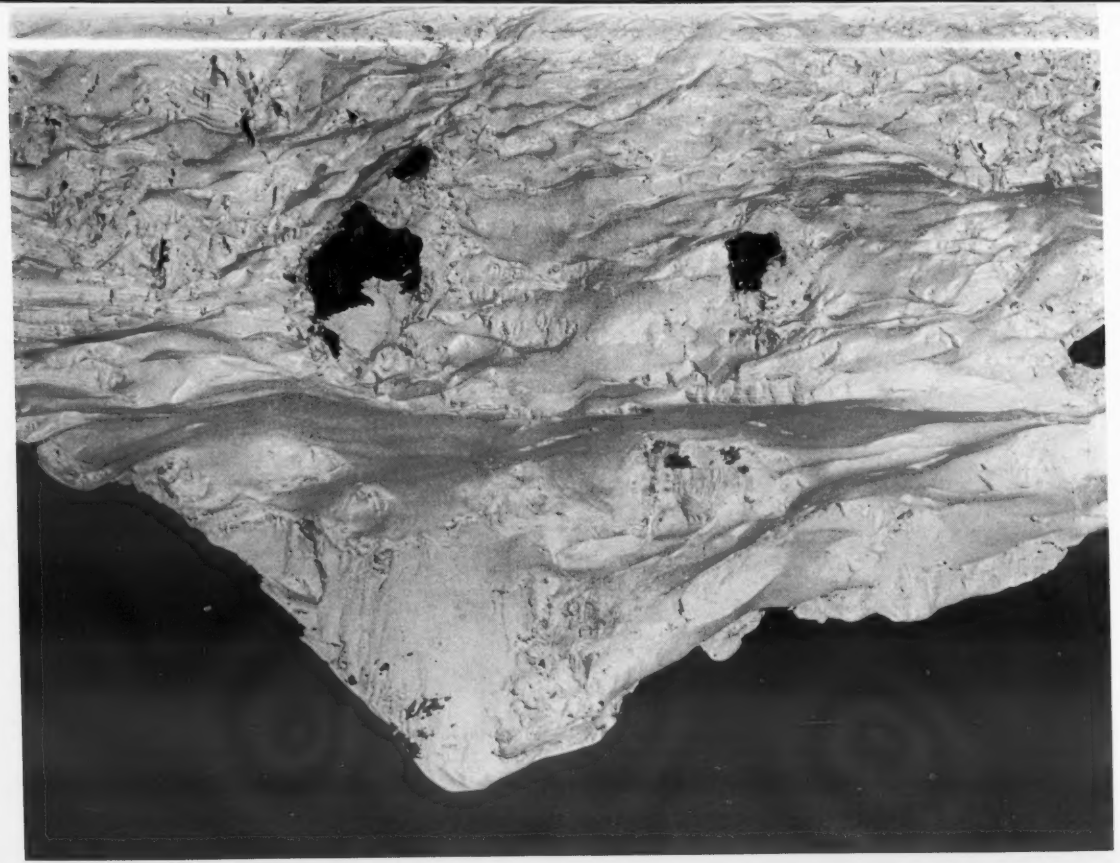
Bob and I continued to Camp V that day, while Mike and Hamish waited at VI in anticipation of a day with less wind and another summit try. On the morning of July 12 we arose to find a great wall of black clouds approaching from the southeast; Bob and I immediately began the descent of the Monk's Head in order to make room for Hamish and Mike at Camp V. The storm was rolling over the southeast ridge of Rakaposhi when we began the descent, and we found that the snow had deteriorated incredibly during the last four days. The fixed ropes had melted deep grooves in the ice, and the ice pitons had melted out—they now swung free from the ropes. It was snowing by the time we reached the 20,000-foot resting ledge. Alas, this was now a honeycomb of crevasses, nothing seemed solid, and only with great difficulty and loss of time did we re-anchor the fixed line here. No sooner had Bob started down the line than he tumbled into a crevasse that "wasn't there four days ago." Heavy snow, wind, and lightning surrounded us. Lower down I huddled against the slope while Bob descended the fixed line. Suddenly I saw a dark object shoot over the edge and disappear into the Biro chasm. Then I saw Bob clinging to the rope out on the Monk's Head face—he had been severely shocked by lightning and had dropped his pack to gain better control; but the pack, instead of sliding down into the basin, had gone sideways and was lost. Bob regained the arête, and I went down to

join him. He was shaken but climbing fairly well, and together we worked our way back into the basin, where we found two items which had come free of the pack: a movie camera and a cup. The snow in the basin was very bad and the trip across to Camp IV was a nightmare. We kept sinking in up to the thigh, and the last hundred feet we went in all the way at every step. Both of us were completely exhausted when we arrived a half-hour apart at Camp IV, where we found the tents nearly collapsed. We put the camp in order, then ate for five hours, and finally faced up to a night at 19,200 feet without Bob's gear. Bob used my sleeping bag, while I used my down jacket and a waist-length sleeping bag that I was carrying for extra warmth. I did not shiver, but I did not sleep either.

We spent July 13 (Friday) in Camp IV resting, talking, eating, sleeping a little. The second night was colder than the first, and although it was still stormy out and we had food for three weeks, it was apparent that we must go down to Base Camp where Bob had another bag. We were away at 9 A.M. and in a few minutes had walked on good crusty snow to the base of the Gendarme. Then suddenly we sank in up to the knee, and the next step to the waist. In an hour we gained only 200 linear feet up to the 50-degree slope of the Gendarme. At times, when the snow would give and give, it seemed nearly hopeless—there seemed to be no bottom at all. The Gendarme was crossed with great caution, while warm, wet snow fell—typical monsoon snow. We reached Camp III in the early afternoon, far too exhausted to continue down that day. The one tent was a collapsed wreck. Inside it we found eggs, apricots, and half of a dead goat which imparted a characteristic odor to the region. We cleaned up the mess and settled in for our third night at 19,200 feet with one sleeping bag.

On July 15 we left Camp III at 8 A.M. and in spite of poor snow were able to attain Cornice Camp in an hour and a half. Then, going over the rise at 18,700 feet my crampons caught, and suddenly I found myself tumbling down the Kunti side of the ridge. The first time around, I saw a group of rocks sticking out of the snow, and as I rolled and came up the second time, I made a blind contact with both hands and one foot, and stopped. It was my turn to be shaken. Bob retrieved me, and we continued the descent. "The Road to Rakaposhi" had disappeared, and the ice slope had only a very thin coating of snow left. I cut down a rope length, but a bruised hand made it too painful to continue, so Bob cut all the rest of the way. He chopped for over three hours, and it was not until 3 P.M. that we arrived at Camp II. For an hour we rested, then off for Base Camp. The couloir was a chaos of rotting and scree-covered ice, com-

PUMASILLO—Lady's Day from the West—Route was on the face behind left ridge, leading directly to the summit.
By David Michael.



pounded with rockfall and waterfall, but at last we came out onto the scree above Camp I. We dodged the last boulder to be fired down on us by Rakaposhi and stumbled down to Base Camp. I was so tired that the porters had to help me out of my windsuit and boots. That night I had the first solid sleep in many weeks.

Hamish and Mike had been following a day behind Bob and me, although we had seen nothing of them, and they arrived at Base Camp late the following afternoon. They immediately declared their intentions of starting a second attempt as soon as we could get a couple of days of good eating, for which purpose we all went down the Jaglot Nullah to Barit. I didn't feel much recuperated, even after two days of eating, and had gained back hardly any of the 30 pounds I had lost. But more compelling, there was a boat that Bob and I had to catch. So Bob and I saw Hamish and Mike off as they started up from Base Camp on July 23, for another attempt. They returned on the 25th, Hamish half carried by the porters and suffering from some undetermined illness. Mike proposed an assault on the summit with Isa Khan, but the latter declined the honor. Bob had a fever, too, but somewhat less violent, so we two decided to leave in the direction of Karachi. In Gilgit I was overtaken by the fever and incapacitated for four days, while the monsoon floods brought transportation to a halt. It all came out all right, however, and we made our ship with two days to spare.

Meanwhile, back on Rakaposhi, Hamish recovered, and he and Mike began the third attempt. They reached Camp III and spent several days there, in bad storms and with inadequate food. They tried to retreat to Base Camp by means of a new and direct descent to the Kunti Glacier, but were prevented by oversized crevasses and returned to the ridge.

We were all much impressed by Rakaposhi. It is a very long climb, and it is a real climb, not just pushing along. This route certainly can be climbed to the summit, and there probably is no other way by today's Himalayan standards. Although we had only 2000 feet to go, the difficulties were not all overcome. The last pitch to the summit will very likely be found the most difficult part of the whole route. My best wishes to the next party, and good luck—they will need it.

Pumasillo - 1956

DAVID MICHAEL

THE Cordillera Vilcabamba is situated north-northwest of Cusco, bounded on the north by the Urubamba and Vilcabamba rivers, and on the south by the Rio Apurimac. It extends east-west for 20 miles, the major terminal mountains being Salcantay (21,500 feet) on the east and Panta (19,000 feet) on the west. Place names in this region are confused to non-existent, but one of the more prominent is Pumasillo—claws of the puma. This name applies to the crescent-shaped group of ten jagged peaks at the head of the Rio Andihuela, which flows eastwardly, and empties into the Rio Urubamba at the Village of Huadquiña. The average altitude of these claws is high, about 18,000 feet, and one of the most prominent, about 20,000 feet, is called Lasuna. This pyramid of ice was to be our primary objective.

Our expedition was a large one, consisting of nine Americans: George Arnis, Fred Ayres, Ginny and George Bell, Andrew Kauffman, Corky and Graham Matthews, Arnold Wexler, and myself; plus two Peruvian friends who had accompanied us on our 1952 Salcantay expedition, and were again of immeasurable aid: Abel-Pacheco Cano, and Señora Mayalay Flury. Although we had planned our expedition carefully, unexpected difficulties brought the usual delays. Almost a month elapsed—customs, red tape, lack of horses, plus confusion in objectives resulting from the possessiveness of various aggressive European expeditions—before we took the train from Cusco to Huadquiña.

Our scouts confirmed the existence of a trail, vaguely indicated on Hiram Bingham's route-map of his 1915 expedition. With four porters, 28 horses and mules, and various wranglers from the Hacienda, we left Huadquiña (5000 feet) on July 5, following a tortuous trail through the steep, jungle-covered walls of the Rio Andihuela canyon. Two days later we had risen to 13,000 feet, established a base camp at the bottom of the Northeast ridge of Lasuna. A mule had fallen from the treacherous trail and had been killed; it is a tribute to these *bestias de cargo* that accidents were not more numerous.

Weather during the entire trip was bad. There was never a day that was not overcast in the afternoon, but we did enjoy three "excellent" days (we were in the Pumasillo group for 38 days), meaning that it did not

actually snow on the peaks; if the peaks were engulfed in clouds and storm, but Base Camp did not record precipitation, the day was defined as "good"; the remainder of the time was "miserable." Four of our members were on restricted time requiring efficient scheduling if they were to climb anything before leaving. After five days of continuous rain and snow the clouds began to rise. Two groups scurried forth: Ayres, the Bells, and the Matthewses to the north of Lasuna to climb a peak crowned with four fantastic ice spires, called with droll humor "Pretty Little Peak"; Arnis, Kauffman, Wexler, and I to the west ridge of Lasuna, to explore the route as far as possible, and later to be joined by the others.

Both ventures collapsed under trying conditions. Pretty Little Peak bogged down in exhaustingly deep powder-snow from the recent storms, but with valiant perseverance the icefall guarding the entrance to the summit basin was reached; here, Señores Ayres and Bell were avalanched but unharmed; with wisdom gained by this experience other slopes could be better evaluated and a return to camp seemed reasonable. Lasuna was just as grim. Climbing for 14 hours, we crossed under the north face, chopped our way up 400 feet of very steep ice (descent by rappel), and reached a dead-end on the corniced west ridge; an 80-foot overhanging ice-barrier mushroomed over the thin ridge, and we required either more equipment or a new route; return was accomplished by flashlight, and next day we re-grouped in Base Camp. Kauffman was recalled to the states, and we lost a strong climber.

That a concerted effort was needed was obvious, and Lasuna received top priority. G. Matthews had reconnoitered the approaches to the east face and had located a rock buttress that split the ice flow of the mammoth east glaciers and offered access to the lower glacial plateau. On July 13, Camp I was placed high (16,000 feet) on the buttress, and as Bell led forerunners into the icefall above the lower plateau, others brought up more gear. Camp II (17,700 feet) was banished to a sérac in the icefall, and reconnaissance continued. It snowed steadily; fog cut visibility to a few hundred feet. We probed for three days—crevasses and dead ends, sunup to sundown, storm and cold feet—before the maze opened onto the upper plateau. The icefall had forced us to the most distant point from the summit cliffs. The plateau was smothered in drifted powder-snow, actually meeting the often-exaggerated phrase "waist-deep snow." Leads were rotated often, distributing the fatigue, but the 800 yards to the bottom of the summit mass required three and a half hours of step-kicking. There are two dramatic features of the leviathan ice mass that culminates at the summit of Lasuna: most obvious is the breath-taking

sweep of sheer ice rising 1500 feet directly to the top; the other is a mammoth bergschrund, a gash almost decapitating the summit. Weaving through the avalanche debris, climbing sharp snow slopes, and squeaking over wind slabs, we reached the left, or south, end of the bergschrund. Snowfall and dark imparted sinister gestures to the grotesque cliffs and séracs. Ayres finessed his way over the narrow end of the bergschrund and inched up to the corner of the summit cornice. The honeycombed, shingle-edged ice ridge offered no security in chopped steps, nor safety in pitons; below, a series of cliffs cascaded 2000 feet to the "Boltoro ships" of the valley glacier. The top was so near, yet so far. With supplies exhausted, we descended to Base Camp. Time ran out for the Bells and Wexler, again cutting our climbing force.

Armed with determination, more food, rope, pitons, pickets, wands, etc., we repeated the well memorized route to Camp I and Camp II, and placed a higher Camp III (18,200 feet) at the upper plateau. At six o'clock, July 23, we left for the summit, but exhilaration from "excellent" weather became dissipated with the exhausting work on the plateau—our old steps were drifted over. Four hours later, just below the bergschrund, the Faucett Airlines, carrying our friends, circled overhead and swiftly disappeared. Reaching the lower lip of the 90-foot overhang, we began working our way to the right, towards a point that appeared to be the only relenting break in the schrund. Steps hacked into the fracture-line of a sérac hanging 40 feet into space did not release its energy in avalanche, but allowed us to cross to the undercut cornices beyond, while space gleamed through holes underfoot. A thin bridge led into a rotten wall, loose snow, and pockmarked ice; we sneaked by with more "tip-toe" chopping. Snow had drifted into the schrund, and five rope-lengths of deep avalanche powder ate up time. Arnis burrowed into the seedy snow to try and hold a fall, I inched to the end of the schrund, completely ignorant of what was holding us up. The clean face of ice, with long shadows, accenting the unbroken angle, plummeted to the plateau. The ice was good, fortunately, and not much of it overhead. Ayres took over and smoothly chipped 200 feet of steps, and the summit ridge leveled off. We enjoyed the last easy 60 feet to the summit, where we arrived at 2:30 P.M. The top was comma-shaped: beginning as a comfortable dome, narrowing abruptly to a roof ridge, both sides dropping off sharply to shoot over rock cliffs. Maintaining balance while walking one-at-a-time to the end was a laughable and dizzy game. Fog denied the comparison of our elevation with other peaks, and we did not tarry. Rappeling over the bergschrund, we returned to Camp III, and next day carried loads off the mountain.

Of the remaining "claws" in this group, we singled out two as attractive objectives and within reach of our present Base Camp. East of Lasuna was a beautifully proportioned peak, whose fluted slabs of ice and cliffs of granite offered few opportunities for a route; we sardonically called it "Lady's Day," meaning "an easy day for a Lady." While worrying, however, we turned again to Pretty Little Peak, and reestablished camp at 15,500 feet, below the long east ridge. Up at 3 A.M. and off at 4:30, we reached the crest of the ridge at sunrise and followed the route of the first attempt. Turning into the icefall and under the 70-foot sérac whose fractures had separated it from the main ice mass above, we labored in deep snow for two hours, eventually crossing into the summit basin.

This catchment was not the continuous plateau we had assumed, but was split open and traversed by four huge crevasses, each one bridged at the far end from the previous one, forcing a zigzag path through the exhausting snow. Because of incessant overcast and daily precipitation the snow never consolidated. At 3:30 P.M. we reached the col between the highest two pinnacles and had to guess which was higher. Choosing the south sliver, we hacked 200 feet of steps on the corniced ridge and arrived at 4:30 on the summit, which overhangs the wonderously fluted south face. Through the fog Ayres sighted his level on the other summit and discovered it to be perhaps ten feet higher! Reaching camp by flashlight, it was agreed to repeat the route and climb the other summit. After a rest-day, Arnis, Ayres, and Matthews left at 2:30 A.M., climbing by moonlight, and reached the bottom of the north pinnacle at eight o'clock. One rope length and two hours of waist-deep snow later, they crossed the bergschrund. Matthews made a spectacular lead chopping 350 feet in flaky, porous ice, plus using chimney technique between the flutes. The summit cornice rocked as they placed a picket for a rappel, and they gingerly roped off. The weather was "excellent" all day, and by late afternoon they had returned to Base Camp. Meanwhile, C. Matthews had found a steep route through grass alongside a waterfall to the glaciers north of Lady's Day. Inasmuch as we had not seen the north side of the mountain, we assumed we might find a route there. Accordingly, while the others were finishing Pretty Little Peak, Corky and I climbed to the Col (16,400 feet) north of Lady's Day. After a few days of "miserable" weather in Base Camp, we established our high camp (14,800 feet) below the north glacier, beside a beautiful lake. On August 3, we retraced old steps across the glacier to the increasingly steep slopes that rise above the rock cliffs. It began to snow, as usual. Although we had little hope of reaching the top, we decided to go ahead as far as we could. We crossed the schrund, and Arnis chopped

upwards and across the first cliffs. Ayres took over and indefatigably chopped for three hours in the thickening snowstorm. At my complaints of being hit on the head too often by ice, Ayres suggested that I take the lead. Gratefully, I struggled through mixed rocks, snow, and icicles, and a short steep pitch to the top of the ridge cornice. But this weak flake was the top; the far side plumeted, seemingly without break, to the grass in the valley. Arnis came up and heard the sizzle of static electricity on the axes. In attempting to drive in a rappel picket we felt the summit shake at every blow, and it seemed better to descend. Retreating to an exposed rock in the slope, Ayres drove in an ice piton, and fixing a line, we backed off into the milky fog and groped for the covered steps. Four hundred and fifty feet of fixed rope brought us safely across the cliffs, and we descended the glacier. The moraine was covered with thin snow, and in our haste to reach the tent before dark, we crashed more than once. Wet and happy, we slid into camp.

In addition to the three major objectives, various other climbs resulted in much reconnaissance of this area. Two lower peaks were climbed by Matthews and Ayres: Old Flattop (16,800 feet), whose summit block of granite imposed some tricky problems; and Terror Tower (16,200 feet), so named because it is the only mountain in the region that looks easy. On August 2, the *bestias de cargo* returned, and we packed out. The peaks of the Pumasillo group because of their proximity to the Amazon jungle offer excessive difficulties in snow conditions, and the supporting core of granite presents awesome relief. They are small as Peruvian peaks go—small, but Oh My!

Summary of Statistics

AREA: Cordillera Vilcabamba, Peru.

ASCENTS: Several peaks in the Pumasillo group, by Ayres, Arnis, Michael, G. Matthews, July, 1956.

PERSONNEL: Fred D. Ayres, George Arnis, David Michael, W. V. Graham Matthews, Corky Matthews, George I. Bell, Ginny Bell, Andrew D. Kauffman, Arnold Wexler, Abel-Pacheco Cano, Señora Mayalay Flury.

The Patagonia Icecap

H. W. TILMAN

THE Patagonia Icecap (*Hielo Continental*, as it is known in Chile) covers some 300 miles from Latitude 44 S to Latitude 51 S. In width it varies from 15 to 50 miles and in height from 6000 feet to 10,000 feet. The boundary between Argentina and Chile follows roughly the crest line. On the Argentine side there are *estancias* almost within sight of the several glaciers which descend from the icecap into the great lakes of Buenos Aires, Viedma, and Argentino; on the Chilean side, where the glaciers descend into deep fjords, there is nothing but tangled rain-forest, rock, and ice. What little exploration of the icecap has been done has been effected from the Argentine side. The Chilean, or Pacific, side is virtually untouched.

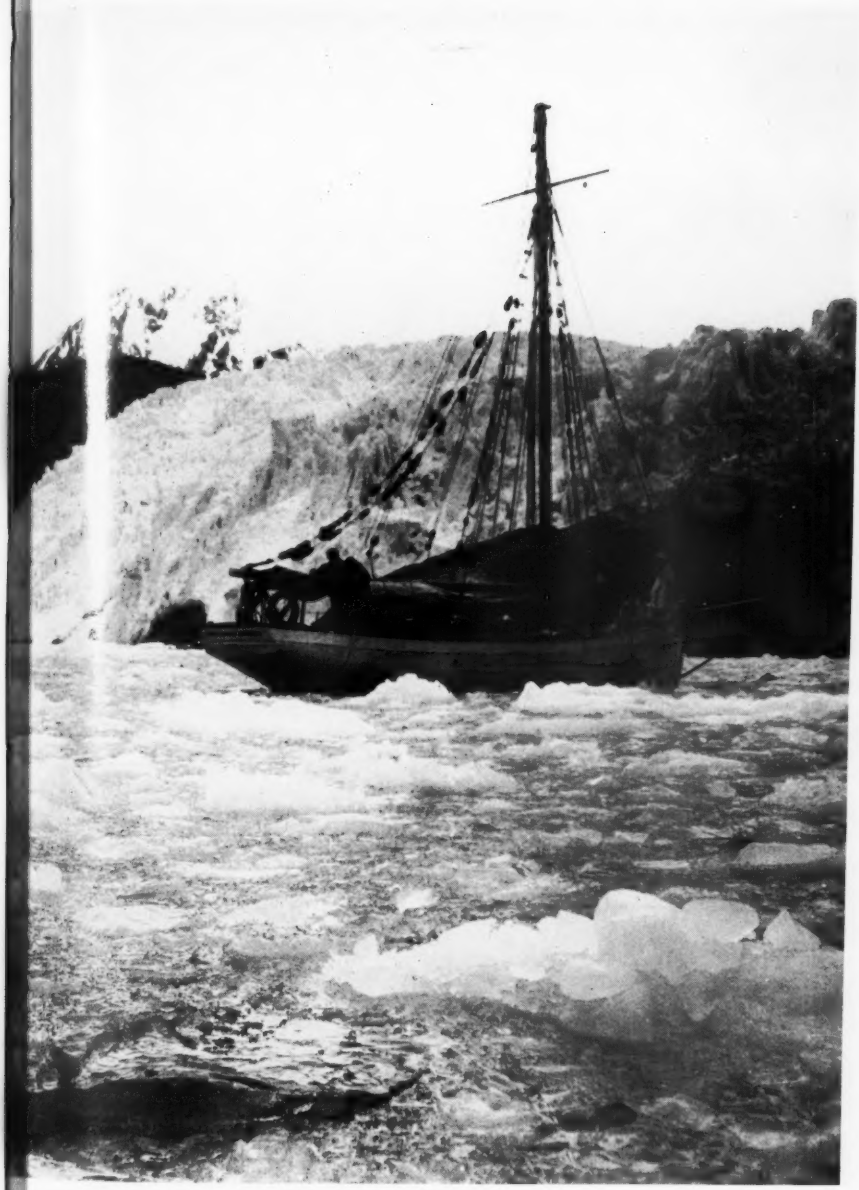
Just as it is proverbially difficult to blow and swallow at the same time, so is it to combine mountaineering with sailing. Except, perhaps, in these Chilean fjords where, it occurred to me, a man might step from his boat onto a glacier; and herein lay the germ of an idea which led me to attempt a double crossing of the icecap. Since 1914 a great many unsuccessful attempts have been made, and I believe the first success was recorded in January 1954 by an Argentine party led by Major Huerta; but of this crossing I have so far been unable to get any details. Of late years my loyalty has been divided between sea and mountains, and this attempt to have the best of both worlds was a little one-sided, for it meant a voyage of some 20,000 miles for the sake of traversing some 50 miles of ice. The boat used was a former Bristol Channel pilot-cutter built in 1906. The crew comprised W. A. Procter, a retired civil servant; Michael Grove, a young gunner officer who, with the enterprise expected of such, sacrificed a year's pay in order to come; E. H. Marriott, a member of the Alpine Club, who came as one of the shore party; and J. Van Tromp, who at the last moment sold his farm and went to sea. The approach march, with which those who write about Himalayan ventures make so much play, I can only glance at briefly, for it would not interest readers of a mountaineering journal.

Sailing from Falmouth July 6, 1955, we touched at the Canaries and thence sailed direct to Montevideo, 4600 miles. On this long haul, which took 64 days, our water allowance was a half-gallon per day for each

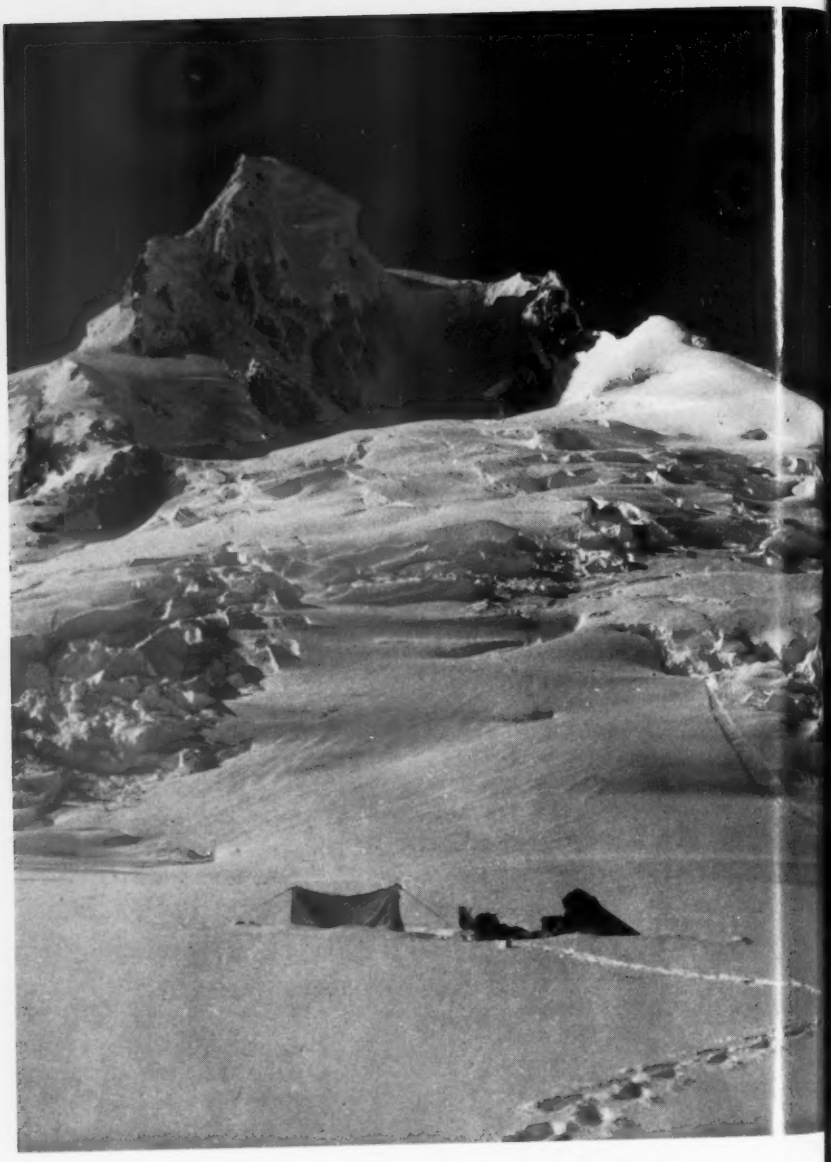
man, but after the doldrums, where we got more than enough rain-water, restrictions could be relaxed. We sailed from Montevideo October 15, having first sent down our topmast in the expectation (duly fulfilled) of rough weather in the South Atlantic. But *Mischief* is such an able seaboat that we never had cause for anxiety. We sighted the Cape Virgins light near the entrance to the Strait of Magellan at 2 A.M., November 5. With a westerly gale blowing we were obliged to stand off and on for two days until the weather moderated enough to allow entrance to the Strait. These historic waters, aglow with the magic of names like Famine Reach, Pelican Passage, Royal Road, Elizabeth Island, stir the imagination, but any hopeful illusion that the low coast is still wild and strange is soon dispelled by the sight of a *frigorífico* on one side and on the other by the great flames of natural gas from the oil wells on Tierra del Fuego. Halfway through the Strait is Punta Arenas (or Magallanes) which we reached November 9. It is remarkable chiefly for its strong climate—in summer it blows hard every day and in winter it freezes—and a nine-hole golf course. Here the Chilean naval authorities went out of their way to help us, and later in the channels we were twice supplied by naval ships.

Before leaving for Peel Inlet, the chosen fjord some 300 miles north, where I hoped to make a landing, I obtained the essential third member for the climbing party—a young Chilean climber, Jorge Quinteros, a beekeeper like Sir Edmund Hillary. Before leaving England I had arranged for a geologist to join us at Punta Arenas, but at the last moment he had had to take up a University post, and I could get no one else. A glaciologist would have been more to the point, but these are rarer birds even than the common geologist, who is not easily caught. However, through the British Embassy at Santiago my need had been made known in Chilean climbing circles, and Quinteros volunteered. He knew no English and I less Spanish; so we got on all the better, and he proved a very able climber.

West of Cape Froward, the most southerly point of the American continent, the coast becomes bolder and snow-capped mountains loom on either hand. More striking still is the worsening weather. Steady rain, squalls of snow and hail, and strong winds usually from ahead, were our portion. For navigating these narrow channels we relied on our auxiliary engine and carried extra petrol on deck to give it enough range. Soon after rounding Cape Froward we broke a valve spring. Under sail alone, tacking every half hour and making less than 20 miles a day, Peel Inlet looked a long way off. After a week of it our luck turned when



Mischief anchored off Calvo Glacier.



CALVO GLACIER AND PEAK ON SOUTH SIDE.

a naval storeship steamed into Columbine Cove, where we had anchored for the night, to see if we wanted anything, and her chief engineer dug out from his stores a spring that served.

This sheltered waterway, which for several hundred miles threads the Patagonian archipelago, is used by most vessels plying between Argentina and Chile and is charted and lit. The scenery is usually described as grand but gloomy, for it is most often seen through driving rain. In the fjords which run inland off the main channel, which are neither charted nor lit, the gloom is often relieved by magnificent streams of ice, their gleaming whiteness shot with lovely tints of blue as they break and curl steeply to the dark water of the fjords. The glaciers discharge great quantities of ice. On quitting the Sarmiento Channel for Peel Inlet we remarked a solitary floe. Thirty miles on, at the southeast end of Peel, floes were so thick that we could not get the ship within two miles of the glacier where I had hoped to land. However, further north, in a branch called Calvo, by forcing poor *Mischief* through ice for a couple of miles we anchored a hundred yards from the snout of a glacier. From it masses of ice fell frequently with a horrible roar, and, as our cable rattled out, steamer ducks scuttled away, a penguin bobbed up, while from a nearby cave a sea lion bellowed in astonishment. Lying at anchor there for three days while the shore party reconnoitered, the ship was constantly menaced by drifting floes, some of them as big as a cottage with its garden thrown in.

The Calvo Glacier, as we named it, presented an icefall which proved as formidable as it looked. More than a fortnight was spent in finding and improving an intricate route, involving two complete crossings of the glacier (here about a mile wide), and in carrying our 400 pounds of stores to a camp clear of the séracs at about 2400 feet. Meantime *Mischief* sought out a safe anchorage with orders to return in January and to cruise off the glacier every Sunday to watch for our signals. Having landed December 16, I did not expect to return before January 29, but we might be stopped (as we nearly were), or some mishap might send us back sooner.

On the névé the going was straightforward, although the many crevasses which were not yet open had to be treated with the greatest caution. With a party of only two, which at one time seemed likely, the risk would not have been justified. At about 5000 feet the snow became hard. We had neither skis nor snowshoes. Either would have been useful, but I am pretty certain that long before we had got our loads through the intricacies of the icefall the skis would have been dumped in disgust.

On January 13, we pitched our eighth camp on what we called the Bismarck Saddle on the Chilean-Argentine frontier and the Pacific-Atlantic watershed at a height of about 7500 feet. Below lay the long, wrinkled Bismarck Glacier pushing its distant snout into the waters of Lake Argentino, behind us the wide, glistening snowfield, and on all sides unclimbed and for the most part unnamed peaks. Below the saddle the Bismarck Glacier appeared altogether too broken—all the glaciers, even when lying at an easy angle, are incredibly crevassed—but by a pass which we called the Calvo we got down to an arm of the Bismarck, crossed it high up, and finally camped on rock, thus reaching dry land, as it were, in the Argentine. Thence a hard six miles on glacier, moraine, and ultimately in forest brought us down to the lake shore close to the great tongue of blue pinnacled ice—a wall over a hundred feet high—emerging seemingly from the forest and projecting into the water for nearly a mile. Ice floes nestled against the wooded shore, the near presence of one such monster obliging me to cut my ceremonial bathe to mere seconds. The close proximity of ice and forest is strange. One walks through open forest of antarctic beech carpeted with yellow violets, while through the trees a few yards away looms this huge wall of ice. Uprooted trees mark the line of contact.

Apart from two blizzards the weather up to now had been better than expected, but on the return journey, owing to six days of high winds with driving snow, we had some anxious moments. Indeed, when stormbound below the Calvo Pass the idea was mooted of a retreat to the Argentine—three days back to the lake and 50 miles or more round it to the nearest *estancia*, and all on two pounds of biscuit! Naturally, on the way over we had made dumps of food for the return journey. It was essential—or we thought it was—to find these. Our first attempt to find the one we had left on top of the icecap—an important dump, for besides food it held all my exposed film—failed. We were going on without it when a slight lessening of the drift and improving visibility as the sun struggled to pierce the flying scud induced us to make another search, fortunately successful.

We bypassed the difficult lower part of the glacier by climbing above it and dropping down to Camp II through 2000 feet of tangled, matted forest. On the way up we had decided rightly against this route, for it would have been impossible to carry loads up. Coming down we had merely to fall and slither, and on January 28 we emerged, scratched and tattered, on the moraine close to our starting point. Next day we were picked up by the dinghy, which had to be pushed and rowed through four

miles of ice floe in order to rejoin the ship. *Mischief* had been unable to get nearer, since in our absence she had been put aground, and during the struggle to get her off, a drifting floe had stripped a propeller blade.

Once more we had to navigate the channels under sail. After I had nearly put her aground again when she missed stays in a gale, I decided to cut the channels and get out into the ocean. We reached the Pacific by Concepción Channel in Latitude 51 S, where we met some heavy weather. But thereafter we made a good passage to Valparaiso, where we had the propeller repaired; thence, via the Panama Canal and Bermuda, to England, which we reached a year and a day after leaving it.

Ojos del Salado

H. ADAMS CARTER

For the past two years there has been considerable speculation as to whether the Argentine peak, Aconcagua, was still to be considered the highest mountain in the western hemisphere. Reports persisted that it might have yielded its place to the Ojos del Salado, which lies in the Andean Cordillera that forms the frontier between northern Chile and Argentina some 400 miles north of Aconcagua.

The American Alpine Club Ojos del Salado Expedition succeeded in making an accurate survey of the Ojos del Salado during July and August of 1956. We determined that this peak has an altitude of 22,590 feet or 6885 meters. This is 244 feet lower than the new altitude for Aconcagua, of 22,834 feet or 6959.7 meters, a figure released by Dr. Eduardo E. Baglietto, Director of the Instituto de Geodesia in Buenos Aires, Argentina, and determined through surveys conducted in the past several years under his direction. (See Appendix III.)

It has not been easy to bring order out of the confusion that existed over the mountain's history. A little had been published on the subject in scattered articles in mountaineering journals, often of small circulation; the rest came from first-hand sources. Writing the history would have been impossible without the unstinting help of the Chileans: Captain René Gajardo, Sr. Juan Simken, Sr. Juan Soltof; and the Argentines: Prof. Enrique Würschmidt, Sr. Jaime Femenías, Sr. Rudolfo Benvenuti; and the Austrian, Herr Matthias Rebitsch. The expedition could never have been organized without the help of Mr. Robert P. Koenig of the Cerro de Pasco Corporation, Mr. Henry S. Hall, Mr. William Rudolph of the Chile Exploration Company, the Andes Copper Mining Company, Prof. Würschmidt, Captain Gajardo, the Instituto Geográfico Militar de Chile, Sres. Arturo Podestá and Boris Kraizel of the Federación de Andinismo de Chile, and Sr. Sergio Barros of the Sociedad Importadora Willys de Chile, and the American Geographical Society.

1. Historical Background of the Ojos del Salado

Nestled among other 20,000-foot peaks of the Andes which soar above the upland plateaus of the Atacama Desert, the Ojos del Salado, highest point in the range, remained for centuries unnoticed. The Spanish con-

quistadores on their 1500-mile overland journey south to conquer Chile, in 1536, crossed the Portezuelo de San Francisco to reach the wind-scoured, inhospitable 14,000-foot-high desert-pampa of Barrancas Blancas within twenty miles of the summit of the Ojos del Salado, but they made no mention of the peak. The Argentine-Chilean boundary commission surveyed the region in 1896 and 1897 and again in 1903. They placed on their maps *an* Ojos del Salado to which they gave the altitude of 6100 meters (20,013 feet).* I have not seen the records of the commission personally but I understand that they had bad weather when they were in the region. They did, however, from two survey stations also observe a very high mountain nearly hidden by intervening ridges; this they called Peak "e."† From one station the altitude of Peak "e" came out to 6878.3 meters and from the other, 6885.8 meters. They averaged 6880 meters.

The German, Walter Penck, systematically explored the area from 1912 to 1914, but in his writings I find no mention of the Ojos del Salado, though he passed by its base several times.

The Ojos del Salado burst momentarily into the limelight in 1937, but the peak in question appears to be not the one so-named by the boundary commission but rather their Peak "e." In that year a Polish expedition climbed six of its higher summits. They discovered that behind a maze of ridges there was a peak that rose higher than any of the other giants of the zone. To this peak they gave the name "Ojos del Salado" (Source of the Salty River), by which it has since been known. Much confusion has resulted from this transfer. From their base camp near the Salina de la Laguna Verde, southwest of the Ojos del Salado, all four Polish climbers headed north up the Río Salado, or Salty River. After a day's travel together, Dr. Witold Paryski and Stefan Osiecki continued northwest to make the first ascent of the two highest summits of Tres Cruces (21,719 feet), while J. Wojsznis and J. A. Szczepanski turned northeast on muleback. Despite fields of nieves penitentes, they crossed a pass to camp at about 19,000 feet. Unable to distinguish which was their peak, they continued upwards rather blindly on foot across sandy slopes and snowfields to the summit of a 21,000-foot peak, probably what is now called the "Cerro Volcán." There they camped beside a frozen lake. The next day

* This peak may be identified from its location. Jaime Femenías, of the Asociación Tucumana de Andinismo, who made a preliminary survey in the region south of the Ojos del Salado, believes that a mistake was made in its altitude and that it actually measures 5100 meters (16,733 feet). It is not the mountain now generally called the Ojos del Salado, which lies to the northwest.

† Since 1937 it has been to this peak rather than to the other that the name Ojos del Salado has been given.

was spent ascending and descending high ridges covered with unconsolidated volcanic gravel and fields of nieves penitentes. A second time they had to camp high on the slopes of the massif. On the third day, February 26, 1937, after traversing another summit to the west and some 500 feet lower, they reached the top of the main peak of the Ojos del Salado. They noticed volcanic action in the crater some 650 feet below the summit, probably the highest in the world.

For about twelve years the region appears to have been left unvisited. In April 1949 Alfredo E. Magnani, Horacio Granero, and Vicente V. Cicchitti, of Mendoza, Argentina, explored the southeastern approaches up the Río Cazadero to about 16,000 feet. A year later three more climbers from Mendoza, headed by Jorge W. Flores, reached the southwestern slopes but failed to attack the Ojos del Salado seriously.

In February 1950 the Chileans entered the picture. Oscar and Carlos Alvarez, Luis Alvarado, and Jorge Belastino camped at Barrancas Blancas, north of the mountain. They apparently had little knowledge of the topography of the region and their account is confused. Although they climbed what they claimed was the Ojos del Salado, their description of it differs from all others. They saw a much higher peak to the west of them, which they thought was Tres Cruces. Doubtless they climbed El Muerto (21,227 feet), the next mountain to the east of the Ojos del Salado. Their "Tres Cruces" was probably the real Ojos.

Guillermo Poma and Francisco Solano Quintana, of Jujuy, Argentina, were the next to claim an ascent of the Ojos del Salado, in November 1951. From their description of routes and times it seems obvious that they climbed a minor peak in the Tres Cruces group above the Río Salado, which despite its name does not spring from the slopes of the Ojos del Salado.

In April 1951 the Asociación Tucumana de Andinismo sent the first of its three expeditions into the region. It was based, as were the subsequent ones, just north of the Salina de la Laguna Verde. Enrique Würschmidt, Jesús Sarquis, Federico Vervoost, and Dr. Guillermo Chaica reached nearly 20,000 feet on the southwestern slopes.

It was, however, after the second Tucumán expedition, in 1955, that the mountaineering world was astounded by a press report of *the ascent of the highest mountain in the western hemisphere.* It announced that the Ojos del Salado rose to 7100 meters, or 23,294 feet, and was therefore higher than Aconcagua. Since I was helping edit the *American Alpine Journal,* I was anxious to get the true facts. Enrique Würschmidt, professor of physical geography at the University of Tucumán and president of the

Asociación Tucumana de Andinismo, was kind enough to send me an excellent report both of the region and of the expedition. It was unfortunately too late to be included in last year's *A.A.J.* After establishing three camps, on January 22, 1955, Prof. Orlando Bravo, Rudolfo Benvenuti, Jaime Femenías, Wilfred Cöppens, Manuel Luis Condomi, and Gerardo Türpe, thinking they were on the Ojos del Salado, climbed to the summit of an unnamed peak which turned out to be some six to eight miles south and about 800 feet lower than the main peak of the Ojos del Salado. *Their peak may at the time have been indeed the highest unclimbed mountain in the Americas.*

They stated that it was possible that the Ojos del Salado was higher than Aconcagua, although they had no proof. The newspapers took the hypothetical statement as fact and made their announcement.

Thanks to this press release, four different expeditions were attracted to three different sides of the Ojos del Salado in the southern midsummer (January and February) of 1956. The Asociación Tucumana de Andinismo returned to the field with a double purpose. Jaime Femenías, Susana Olmos, and Guillermo Muntaner made a preliminary survey of the region, but they lacked control to establish any definite altitudes. In the course of their work they climbed to within a thousand feet of the summit of the Cerro Solo (20,309 feet) and made the second ascent of the Cerro de los Arrieros (18,375 feet), which Femenías and Türpe had climbed the year before. The climbers of the group, Orlando Bravo, Alfredi Bolsi, Pedro Pérez Cherp, Flora Albornoz, and Wilfred Cöppens, joined forces with the expedition from the Agrupación Montañesa Calchaquí de Catamarca, made up of Julio César Díaz, René Peralta, and Enrique Carrazano. Together they reached about 21,000 feet on the Ojos del Salado's southwestern slopes.

At the same time the Austrian, Matthias Rebitsch, was making his ascent from the southeast and the Chileans theirs from the north at Barrancas Blancas. The Chilean group of 26 climbers, sponsored jointly by the Chilean Army and the Federación de Andinismo de Chile, was under the leadership of Captain René Gajardo. On their return they claimed an altitude of 7084 meters (23,241 feet), obtained by aneroid barometer, a statement which was seized by the press as an exact altitude. Considerable nonsense has appeared in print, which has cast doubts on the validity of both the Austrian and the Chilean ascents. I have seen the photographs and have talked with or communicated with most of the climbers of both groups. There is no doubt whatsoever that at this date, there have

been three ascents of the Ojos del Salado—the Polish, the Austrian, and the Chilean.‡ (For accounts of these ascents seee appendices I and II.)

2. The American Alpine Club Ojos del Salado Expedition

While collecting data on the Ojos del Salado, some of which is found in the first section of this article, both information and misinformation seeped in, so that the picture became, instead of clearer, decidedly more confused. The mountain had been climbed by such and such a group; it had not been climbed by them. It lay here; no, it lay there! It had been recently triangulated; it had been measured only by aneroid barometer. A new much higher summit had been discovered; there was no such summit. Throughout all the articles and correspondence there ran either the speculation that the Ojos del Salado might be higher than Aconcagua or the definite statement that it was. It finally became clear that the only way to bring order out of this chaos was to go to the region and find out the facts for ourselves. Therefore, the American Alpine Club Ojos del Salado Expedition was born in May 1956. Since we had discovered that all the recent reports of altitude were indeed based on readings of aneroid barometers, a notoriously inaccurate method, we would triangulate the peak and settle the question whether it was the highest mountain in the western hemisphere or not. How much climbing we could do we should have to see after we had completed our main objective. We also knew that the weather would have a definite bearing on how much we could accomplish.

Little seemed to be known about weather conditions in the region during the southern hemisphere midwinter. We had reports of crippling blizzards that dropped many feet of snow, We knew, however, that the Ojos del Salado rose above the incredibly dry Puna de Atacama, possibly the most arid region in the world. The Argentinean, Dr. Würschmidt, sent us a description of what his somewhat scanty evidence indicated were probable weather conditions. He stated that there was less cloudy weather and precipitation in the winter than in the summer months and guessed that we might count on cloudless skies up to 85 percent of the time. What precipitation there was would not be great in quantity. Temperatures would depend much more on the sun than on the season, though it would be somewhat colder in the winter. In summer and winter we would have both subzero cloudy days and rather warmer sunny ones. In any case the

‡ I have just received word that the fourth ascent of the mountain was made on January 11, 1957 by Alfredo Bolsi and Wilfred Cöppens, members of the Argentine expedition of the Asociación Tucumana de Andinismo under the leadership of Jaime Femenías. They reached the Polish cairn but decided against climbing the rock tower, ascended by Captain Gajardo's party, which is about ten feet higher.

dry air would cause the temperature to plummet downwards in the course of a few minutes after sundown. The constant high winds would be our worst enemy at any time of the year. His description proved an accurate one.

How to enter the region and how to cover the great distances during our survey posed the next problem. Transportation seemed solved when the Chilean mapping service, the Instituto Geográfico Militar, offered to send a survey team of two officers and a half-dozen enlisted men with us and to provide two 2½-ton army trucks. The Chilean mountain troops loaned us Captain René Gajardo, who proved a tower of strength and a loyal companion. The knowledge he had gained of the region when he had led the Chilean expedition up the Ojos del Salado half a year before was of course invaluable.

We met in mid-July in the northern Chilean port of Antofagasta. Bob Bates and his wife, Gail, arrived by sea with the expedition equipment. Our chief surveyor, Peter Weaver, my wife, Ann, and I flew from the north. Harvard student John Wylde interrupted a skiing holiday in Central Chile to join us. Major Luis Correa flew north to make arrangements with us about meeting in the region. He would take his survey party in one truck directly east into the zone from Copiapó, while we, with Captain Gajardo and our driver, Corporal Alberto Soto, would approach it from the north in the other.

From Antofagasta it was a long trip south across mountainous desert to the Andes Copper Mining Company's mine and smelter at Potrerillos. About twenty-four hours after our departure we emerged from the top of the baggage in the back of the truck covered from head to foot with a full quarter-inch of dust.

We needed an established elevation from which to start our survey. In the length of time we had it would have been impossible to survey across the jumbled mass of ranges that lay in the 150 miles between the Pacific Ocean and the Ojos del Salado. The Chilean Instituto Geográfico Militar had its nearest station at Carrera Pinto still about 100 miles to the west and separated from the mountain by very rough terrain. We had reason to believe that the Andes Copper Mining Company had established accurate altitudes around Potrerillos. This proved to be the case. The elevation of Potrerillos had been determined to within inches by running lines of differential spirit levels when the railroad and transmission lines had been put in. Moreover, in the never-ending quest for water for the mine, other lines of levels had been run towards the Ojos del Salado above the

Salar (Salt Flat) de Maricunga. We were now assured of a highly accurate elevation about forty miles from the peak.#

The officials of the company were extremely helpful, but they were also very discouraging. Why were we entering this desolate, uninhabited, inhospitable region in the dead of winter? Why had two of us brought our wives into these mountains where even men did not penetrate at that season? Did we realize that a blizzard might immobilize us for weeks, or worse? Had we heard of the hurricane winds that were not the exception but the rule? It was therefore not without misgivings that on July 21 we drove away from the comforts of the mine into the cold as snow flurries seemed to foretell a full-dress blizzard. Around us barren, precipitous slopes, bare of all vegetation and brilliant with the reds, greens, purples, yellows, and browns of a heavily mineralized soil, rose upward into black clouds that now were whitening the upper slopes with a blanket of snow. We crossed a 12,000-foot pass to the salt flat of Pedernales. In improving weather but over several inches of snow, we crossed this huge basin to La Ola at its upper end, where three men from the mine were stationed to see that the small salt stream did not freeze as it entered the pipe to run fifty miles to process the ore at the mine. It was in the bright light of the moon, 30-odd miles beyond La Ola, that we camped at 12,500 feet on the northern edge of the Salar de Maricunga, where the road from Copiapó met ours. To our surprise Major Correa and his surveyors had not yet arrived.

The next morning with numbed fingers I pawed through the boxes in the back of the truck for the breakfast. The salt eluded me but the solution seemed easy. I could cook the cereal in salt water from the nearby salt lake that steamed unfrozen in the zero temperature. As the Bateses and Ann readied our four-man tent to accommodate eight for breakfast, I set off across the strangest frost formations I had ever seen. Only gradually did I realized that I was walking, not across frost and snow, but over white crystals of usable salt.

The truck had no antifreeze, and Soto, unaccustomed to such temperatures, had not known that he must run the motor as he drained the radiator. Consequently the water still remaining in the engine had frozen hard during the night. Leaving Soto to thaw the motor and Gail and Ann to melt enough snow to fill the radiator again, the rest of us climbed the 15,453-foot Cerro de la Sal that rose above camp. The mountain was easy technically, but we puffed and panted up the loose volcanic gravel in the rarefied air to which we were not yet acclimatized. Below us stretched the

For details on the survey itself, see Weaver's engineering report, Appendix IV.

Salar de Maricunga, typical of the many huge, barren salt-flats and pampas that form the backbone of the cordillera. Lying at altitudes as high as many of the summits of the Alps, these flat basins are hemmed in by 16,000-, 18,000-, or even 20,000-foot volcanos and ridges which in turn separate them from the next pampa. We had a magnificent view across Maricunga with its white of snow or salt, its browns, yellows, greens and reds of wind-cleared ground, and its turquoise of salt lakes, the remnants of an upland sea of a less arid era. After stretching out flat for twenty miles, the terrain suddenly rose abruptly in the slopes of the 19,947-foot volcano Copiapó. To the southeast, 21,719-foot Tres Cruces still blocked our view of the Ojos del Salado.

The next morning we set out to reconnoiter the snow- and ice-chocked 15,000-foot Portezuelo Colorado, the pass that led to the next pampa, the Campo de Piedra Pómez, and to Barrancas Blancas at the foot of the Ojos del Salado. We entered the canyon of the Colorado to find the first water hole we had seen since we left the salt stream above La Ola, fifty miles behind. The water had spilled out over the valley floor, leaving the road blue ice dusted with snow. Since no chains had been available for our vehicle, for the first time in the experience of any of us we set about cutting steps with our ice axes for a truck. Higher up in the pass we shoveled a track through the drifts where the wind had heaped up the snow in the shelf scratched out of the steep slopes, the "International Highway" to the Argentine. We managed to advance only about three miles up the pass that day.

With still no news of the Chilean surveyors, on the morning of July 25 we bucked and shoveled our way across the whole of the Colorado Pass and down onto the snowy but flat Campo de Piedra Pómez. Cutting through the snow and hard crust of pumice soil, the wheels churned ineffectually in the loose pebbles below, making progress painfully slow. By early afternoon we had traveled twenty miles, half way to the base of the Ojos del Salado. Captain Gajardo excitedly pointed out the sharp summit cone of our peak rising above the shoulders of closer ridges. By sundown we had cajoled the truck to the top of the Portezuelo de Piedra Pómez. Trampling and shoveling the snow in front of the truck and with the determined Gajardo at the wheel, we arrived by midnight at our goal, Barrancas Blancas (White Banks).

It dawned clear and still, but the thermometer read —20° F. We set about moving the base camp to a more protected spot nearby. Before the last loads were thrown back into the truck, the wind came up with the speed of a squall. In a very few minutes it reached hurricane force, driving

head-high icy particles which cut our faces like sandpaper. The only sensible course was to retreat temporarily to the comparative protection of Colorado Pass to avoid the possibility of having the truck snowed-in till spring.

That twenty-mile retreat took us twenty hours. The radiator froze repeatedly as we bucked terrific winds. Moisture froze in the gas line; poor Soto, our driver, had to dismantle it and blow it clear, not an easy trick in a subzero hurricane. Our traction in the loose pumice gravel became even worse as the snowdrifts grew and hardened in the wind. Shoveling drifts helped keep us warm but at nearly 15,000 feet it was exhausting work. By nightfall the truck, driven by the tireless captain, had battled its way back only as far as the top of the Portezuelo de Piedra Pómez. We pushed on, seriously concerned whether the truck could get out or not. In the dark the ridges stood outlined with broad crystal ribbons where the rising moon struck the graceful plumes of powder snow that swirled above them. At about two A.M. we saw the unbelievable: headlights coming towards us. It was Major Correa's party, who, weary and half-frozen, had spent four days struggling over the snowy passes from Copiapó. Worried about us in the storm they had pushed on to find us. Together we all labored back up their tracks to the illusionary shelter of the Colorado Pass. There we tried to pitch our four-man tent. While the Bateses held the windward corners, Ann and I inside struggled to raise the pole. As a particularly strong gust of wind caught us, all four rolled some thirty feet end-over-end like a floppy package wrapped in canvas. We finally spent what was left of the night collapsed in exhausted sleep in the back of the truck on top of each other and the luggage.

When we awoke a few hours later, the wind had dropped. It was cold and sparkling clear. While the military worked to start the balky trucks, Pete Weaver and I climbed the 16,000-foot peak that rose immediately south of us to reconnoiter for the survey. Upon our return we discussed plans with Major Correa. Although we had looked on the retreat as temporary, he definitely did not. His enlisted men were poorly clothed. Their tentage could never have stood the high winds. We Americans might have stayed on alone and without transportation, 100 miles from the nearest habitation, as we had a month's food-supply and excellent equipment, but to remain under these conditions seemed hardly sensible. Thoroughly frustrated, we retreated with the Chileans 700 miles to Santiago. All that we had accomplished so far was a hurried reconnaissance of the region that convinced us that we really could do the job.

A hectic but delightful week in Santiago put the expedition back in the field again. We should never have managed it without the help of the

OJOS del SALADO—Surveying the baseline.

OJOS del SALADO—The survey-party.

OJOS del SALADO.

OJOS del SALADO.

Federación de Andinismo and the generosity of the Chilean Willys agency. John Oberlin arrived in Santiago just in time to share in a very successful "joint meeting" of the Federación and the American Alpine Club.

On August 7 a much abbreviated party rolled out of Santiago packed into a brilliant red Jeep and a bright green trailer. Of the original party only Peter Weaver, Ann, and I had time left to return. We were strengthened by the addition of a member of the Federación de Andinismo, the Chilean mountaineer Roberto Busquets. He is well known for his Andean ascents and had been a member of the first Argentine expedition to Dhaulagiri. At dawn on August 9 we headed east from Copiapó and by midafternoon had crossed the width of Chile to the Salar de Maricunga. We put our camp at 13,000 feet at the lower end of the Aguada (water hole) del Colorado on what the rather sketchy maps of the area call the Río Colorado. Only after comparatively warm days did the mighty "Colorado River" trickle a hundred feet or so past camp before being swallowed by the thirsty volcanic soil. Sundown always put an end to our water supply since temperatures could plummet to below zero in a very few minutes after the sun left the moistureless air.

Our previous reconnaissance enabled us to set to work at once with a good idea of what was involved. First of all we had to choose the final locations for our eighteen survey stations. These eventually extended from Base Camp ten miles north across Maricunga to tie in with one of the stations on the Andes Copper Mining Company's line of levels. They reached out east across the high ridge which is cut by the Portezuelo Colorado and out onto the Campo de Piedra Pómez for about fifteen miles. From five of the latter stations we could observe the sharp spire of the summit of the Ojos del Salado rising above its crater edge. Each carefully selected station was marked with a long pole held firm against the winds by a large rock-cairn big enough to be sighted through the theodolite from the neighboring stations. It is arduous work to be a stone mason at 15,000 and 16,000 feet. Once the cairns were built, we returned a second time with the theodolite to measure the horizontal and vertical angles between the stations, which would, by trigonometry, give us exact distances and altitudes. It was no mean trick to operate the instruments on the frequent days when icy winds numbed Pete's fingers and constantly filled his eyes with water as he crouched over to peer into the theodolite. Roberto would attempt to shield Pete from the wind. Meanwhile, Ann or I, huddled over the precious angle books with backs to the gale, would slip gloved hands out of bulky arctic mittens to record the figures. It took a long time to make the ten readings taken of each angle under conditions like these.

Whenever possible we approached our stations by jeep, a vehicle far better suited to the terrain than the 2½-ton army trucks. With chains and antifreeze and no longer so "road" bound, we could get to the base of the mountains where our stations had been placed and in some cases actually drive our mountain climbing jeep right to them. I had never before made "first ascents" with motor transport. We still had our transportation difficulties, however, caused by the water in the 100 gallons of gasoline which the enterprising filling station in Copiapó had added to stretch its profits. In order not to have to remove the gas line and melt it over a gasoline stove as we had to do the first morning, it was a nightly ritual to syphon all the gas out of the tank and to drain the carburetor and gas line.

We worked without interruption from sunrise to sunset except on two days on which it snowed. Mercifully the accumulation was small. It was after the second of these storms that we discovered to our horror that the ignition switch of the jeep had been left on. For thirty-six hours electricity had been draining out of the battery. No amount of pushing, cranking, or ingenuity during that desperate morning would start the vehicle. The nearest good battery was at Potrerillos, 100 miles away. Leaving Ann and Pete to continue the survey on foot, Busquets and I shouldered heavy packs, to trudge the fifty miles that separated us from the three men tending the dam at La Ola. Normally water would have been a problem, since none exists on the whole route between the fresh water at Base Camp and the salt stream at La Ola. Even there the men are dependent on water brought them from Potrerillos. However, we could melt the snow from the drifts of newly fallen snow. Bucking a wind so strong that we took turns breaking it, we reached the northern end of Maricunga by sundown. The next day we crossed the pass that leads to the Salar de Pedernales and descended towards the salt flat. It was not until the third day that we reached La Ola and help. On foot we began to appreciate the enormous scale of the country. Towards the end of this gruelling march, we saw more of the birds and animals that live in this inhospitable region. We had already seen herds of graceful guanacos (the llama's wild cousin), foxes, partridge, sparrows, and a single giant condor. In La Ola we saw numerous water birds, including sea gulls, pintails, teal, and lovely black and white geese known locally as *peuquenes*. The strangest of all were the rheas, the American ostrich, which ran from us with lightning speed as we approached. A company truck drove us from La Ola to Potrerillos, where the company officials gave us immediate help. On the fifth day after our departure we were back at Maricunga with a new battery and a large piece of fresh beefsteak.

Together again, all four continued the survey with redoubled energy, for time was running out. Perhaps the loveliest day was the one when we occupied Station Roberto. (All the stations bore the names of members of the party or their offspring.) This station lay at 16,313 feet on one of the summits of the Cordillera Claudio Gay between Maricunga and Piedra Pómez. In order to make use of the usual comparative lulls early in the morning, we left camp several hours before dawn in the light of the nearly full moon. As we ascended the Colorado valley, the 40-foot cliffs that hem in the canyon on both sides looked like huge jagged peaks in the half light. The sun touched the 20,000-foot mountains around us with a gorgeous dawn-glow long before it reached us. We four were well acclimatized and reached the summit in about four hours. To the south rose the colossal masses of Tres Cruces and of the Ojos del Salado, while other 20,000-foot peaks hid the horizon to the east. On the other side we looked down on a lava flow which looked as if it had just descended from the very summit and cooled there. Beyond we saw the many colored Salar de Maricunga. No wind disturbed the beauty of the scene or slowed the observations.

After another week of comparatively kind weather, the surveying was done except for the measurement of the base line. Base lines are a finicky kind of thing that require the greatest precision; the slightest error would be magnified enormously, as its length is projected and expanded into the whole survey. It took us two days to place and drive the stakes, lined up to the millimeter with the theodolite and spaced at precise 25-meter intervals with a standardized steel tape pulled out to exactly 22 pounds of pressure. It took a morning to run a line of levels along the base line stakes and back again to determine the exact differences in altitude between them. After lunch, confident that in a few hours we would be finished, we unwound the tape to start the final measurements. As was so often the case, the wind had been increasing steadily all day. As I held the scales with which we stretched the extended tape, a terrific gust caught the thin steel ribbon. With a sharp snap and a gigantic leap, the tape whip-lashed the air, while Ann held tight to the other end 50 meters away. The same horrid thought struck us all: the tape had snapped. No tape meant no base line; no base line, no survey. Like possessed beings, Pete and I lunged for the whipping end. It was still intact! The gust had merely forced open the clip that held the tape to the scales. Since it would have been madness to continue working in that gale, we retired to camp determined to return the moment the wind fell, whether it were midnight or dawn.

While Ann nervously watched the canvas of our four-man tent strain and bellow against its swaying metal framework and listened to the cloth of Pete's and Roberto's nearby mountain tents snap in the wind like the crack of a rifle, we prepared our final banquet of crabmeat and noodles. Over the last of the fifteen bottles of excellent red wine that Roberto had insisted on bringing from his family's vineyards, we heard our nightly quota of tales, true, to be sure, but fantastic and losing nothing in the telling. Roberto transported us to remote parts of the Chilean cordillera or dynamited tent platforms on lofty Dhaulagiri. With Pete we dived for sunken treasure in the waters of the Pacific or ate monkeys' hands presented by naked head-hunters in the jungles of the Amazon. The wind still buffeted the tents as we crawled into our sleeping bags.

The hush of the now windless night awoke us an hour before dawn. We wasted no time. The first run of measurements along the length of the base line was done before the sun rose. We were a well-drilled team. While Ann held one end of the 50-meter tape on the pinpoint mark on one stake, I stretched it with the scales and Pete, at my side, marked a precise 50 meters on the second stake from her. Roberto guided the tape over a nail in the intermediate stake to eliminate sag and read the temperature each time on an attached thermometer. The sun struck us as we began the second run: twenty minutes later it was eighteen degrees less frigid. Towards the end of the third and last run the wind picked up; so suddenly and strong did it come that if we had started ten minutes later, we could never have finished the job that day. Scudding clouds foretold worse weather as we broke camp that morning of August 31, three weeks to a day after we had reached Maricunga for the second time. Violent sandstorms pockmarked the windshield as we turned the jeep back towards civilization. The weather worsened as we advanced. As we crossed the last pass before Potrerillos, the snow began to fall.

Appendix I

THE SECOND ASCENT OF THE OJOS DEL SALADO

By Matthias Rebitsch

On January 5, 1956, we left Buenos Aires. Our group consisted of Verena and Anders Bolinder, the Swedish couple with whom I had reconnoitered the southern Peruvian Cordilleras in 1952, the outstanding Argentine mountaineer, Sergio Domicelj, secretary of the Centro Andino Buenos Aires, and me. After overcoming an endless series of mishaps, we finally were able to head our 12 pack animals from Fiambalá in the Province of Catamarca

towards the Ojos del Salado. After days of riding across the high desert, on January 22 we reached our base camp near the Agua Calientes caves at 13,600 feet. Near the hot springs we found roots for fuel and grass for the mules. An ideal camp site!

To acclimate ourselves to the altitude, we made the first ascents of two nearby peaks of over 19,000 feet that lay to the east and west of the Tres Lagunas Negras Pass. From them, we could clearly see the route to and up the Ojos del Salado. After a two-day storm which transformed the brown, arid Puna into an icy winter landscape, Sergio Domicelj, the muleteer Santos Carrizo, and I started out to try the Ojos del Salado. We had chosen the shortest but as yet unattempted eastern route. After crossing the 17,400-foot Tres Lagunas Negras Pass, we pitched our Base Camp at 17,700 feet at the foot of the Ojos beside a broad field of nieves penitentes on a flat above the Lagunas Negras (black lakes). Carrizo turned back with instructions to return for us in six days. During continuous loathsome wind squalls, Sergio and I established, in the next three days, first Camp I at 18,400 feet and then Camp II on a saddle beside crags at 20,350 feet. The climb there with our 65-pound packs was tiring, but technically easy. The route led across lava slopes with loose debris, large boulders interspersed with fields of bizarre nieves penitentes. I had the feeling that I was suffering from mountain sickness more than in the Himalayas at similar altitudes. Thirst also plagued us much more.

Late on February 1, the steady wind rose to hurricane force and, despite the protection of the stone wall we built, our light-weight tent was torn to bits in the night. It was a bad night! At 6:30 on February 2, we left Camp II with high winds and low temperatures. There were no climbing difficulties and the sky was still clear, but banners of flying snow hung off the ridges which themselves had been blown clear. So sharply did the wind and biting cold attack us that soon hands and feet lost all feeling. Since Sergio, my ideal climbing companion, unfortunately did not have really first-class clothing, he had to turn back to save fingers and toes. He deserved to reach the top as much as I.

In deteriorating weather and gathering clouds, I had to summon all my willpower to climb on, although I was somewhat protected from the icy wind by my face mask. I had to brace myself against the fierce wind, propped on two ski poles, as I fought my way up the sliding scree slopes and snowfields that robbed me of my strength. It was a deadening, monotonous struggle up the frozen crater-landscape of almost oppressive monotony and lifelessness. Almost all the usual impulses were lacking that

drive us upward in other friendlier and more beautiful mountains. It was almost only an experiment of pure willpower simply to reach the goal that lay above. As I climbed on alone, mountain-sick and lonely, I had, for the first time in my life, the impression that I was not unaccompanied. Previously I had always been very skeptical towards this Himalayan "ghost companion."

At 1:30 P.M., I suddenly found myself on the flat, snowless summit ridge. On the highest point of this, I found the cairn the Poles had built in 1937. It contained a narrow round tin can (Ovomaltine, I believe) with a single calling-card with their names: J. Wojsznis and A. Szczepanski; one printed, the other in pencil. I added my calling card to theirs, but without writing the date, for I had no pencil.§ Photography was difficult and in the few seconds I was without my gloves, I froze my fingers slightly. My Lufft aneroid barometer read about 6870 meters (22,540 feet). Although recent reports had placed the Ojos del Salado higher than 7000 meters, I had the personal feeling at the time that my readings probably were not far wrong. I had brought a thermometer to determine the temperature and thus to eliminate that possible source of error, but while pulling it out of its case with my clumsy mittens, I broke it. I have been told that Gajardo's party found a maximum-minimum thermometer near the summit; it must have been mine.

The view through the broken clouds was very limited. From time to time, there loomed out of the gloomy murk a tower-like jagged point, separated from me by a deep gap. The mists distorted dimensions and made it hard to judge how far away it lay, but I assume it was 75 to 125 feet away and some 8 to 12 feet higher than the spot where I stood beside the Polish cairn. Although I considered the problem of the ascent solved, I did want to get closer to the jagged point, so climbed down into the gap. However, the wind was growing even stronger and threw me continually off balance while I climbed. I could not remove my mittens to grasp the rock. As the danger was too great, I turned back.

I descended snow and volcanic gravel slopes to Camp II and descended from there the same evening with Sergio to Camp I. He had been able, while wrapped in both sleeping bags, to massage his fingers and toes and thereby save them.

Meanwhile, the Bolinders and Santos Carrigo had made the first ascent of the Cerro Aguas Calientes (18,100 feet), which rose above our Base

§ This would explain why the Chileans did not realize that Rebitsch had made the ascent. They found two cards and must have assumed that Rebitsch, with his Slavic name, was one of the Poles. — H.A.C.

Camp, and had an excellent view of the unexplored volcanic area north of the Paso San Francisco. They carried out an extensive reconnaissance, during which Bolinder made the first ascent of Incahuasi Chico (about 19,650 feet).

Appendix II

THE THIRD ASCENT OF THE OJOS DEL SALADO
by Captain René Gajardo

On the morning of February 4, in Camp I (19,400 feet), our small group awoke in rather bad physical condition, suffering from mountain sickness. Two ropes (Capitán René Gajardo, Sargento Nemesio Zamora, Luis Alvarado, Vicente Chiaranda, and the American surveyor, Wayne Miller) headed south to establish Camp II. The slopes grew steeper and were mostly covered with large snowfields. The increased wind, carrying with it snow and ice particles, made climbing difficult. We ascended ice for a long time, since a large part of the terrain between the two high camps was covered by snowfields and nieves penitentes.

The only two real glaciers on the mountain lie on this northwestern slope. Both end in tongues that descend to the northwest and northeast to be absorbed in the thirsty gullies below. The steeper lower glacier probably was once an extension of the upper one. The penitentes rose to as much as six feet above the surface of the glaciers. The snow-covered crevasses of the lower glacier required care and finally, to avoid these difficulties, we traversed it from north to south.

The temperature, already low, kept dropping, exhausting us. Starting at 19,500 feet, we had to surmount the upper glacier which had a few deep crevasses. Finally, we established Camp II at 21,000 feet, on a bit of clear ground between the upper glacier and a large field of penitentes that descended from the southwest. From there, we could see the northern rim of the crater.

The night of February 4 was too cold. Fatigue let us sleep for a long time, but later sulphur fumes driven by the strong wind from the fumaroles of the Ojos del Salado nearly asphyxiated us. We suffered from headaches, all the more when it was cold.

Leaving the camp set up, we left for the summit at 7:30. After crossing fields of penitentes, an hour-and-a-half later we reached the northern rim of the crater. This is a dormant volcano with fumaroles that continually and with considerable rumbling expel clouds of sulphurous smoke. At times we were nearly suffocated, but when the wind changed direction

those of us who were somewhat bolder went close to look into these mysterious cavities. The crater of the volcano is about 1300 feet across and has badly eroded walls of volcanic gravel, pumice, and basalt, and others of scoria. This northern rim is considerably lower than other parts of the crater's edge. A number of fumaroles in the crater puff in unison, showing subterranean connection.

We continued along the rim towards its highest part. Again the strong wind, which carried with it fine sand, the low temperature, and the rarefied air began to exhaust us. We had to rest more and more frequently, sometimes after only a few steps. The slope became more difficult. We had to zigzag to avoid steep patches of loose volcanic gravel. Thinking that we should arrive momentarily at the summit, especially after we surmounted one rise after another, our nearly exhausted group finally caught sight of a jagged tooth rising some 300 feet above us on the northeast corner of the crater rim. Basalt blocks seemed to be heaped up one on the other, precariously balanced.

After a long rest, we began the ascent of a gulley of rotten rock, which became even looser as we ascended. Next we climbed a chimney full of loose rocks which got narrower towards the top. The final obstacle was a large wall of insecure rocks, which at this altitude and in this cold was difficult for us in our exhausted state. Above this wall, a precariously balanced rock momentarily delayed the final ascent. After we had surmounted this, we found ourselves on the roof-shaped summit. The flat part was about ten feet long and a foot or two wide. It fell off on each side, first gently, then steeply.

We stood on top at 2 P.M. and stayed there for about forty minutes, taking pictures and reading our aneroid barometer, which showed 7084 meters (23,241 feet). Despite the wind and our fatigue, we enjoyed the magnificent panorama. The sun shone brilliantly and everywhere we saw mirages and multicolored reflections where the sun's rays struck the highly mineralized peaks. Toward the west was the silver mirror of the Pacific, cut here and there by high summits. Towards the east, there was another distant horizon, yellowish in color, the Argentine pampa, also broken by closer big peaks.

We descended slowly and reached Camp II at 5 P.M., which others had already reached from below. We continued on to Camp I where we discovered that through a misunderstanding climbers had ascended from Base Camp, not leaving space for all of us. Half of us continued on to Base Camp, where we arrived at 10 P.M. On the day of the ascent, the maximum temperature was 48° F; the minimum, —18° F.

On February 6, the climbers left in Camp II started out at 8 A.M. The group (Juan Soltof, Juan Simken, Erick Segura, Raúl Araya) went east, following the northern rim to ascend the back side of the peak to reach the cairn. There they found the cards left by the Poles in 1937. The cairn lies about ten feet lower than the top of the jagged peak which we had climbed the day before.‖ Simken and Soltof climbed the other summits of the massif, which lie close together towards the west. They measure about 540 and 685 feet less than the main peak. On the same day they broke camp and all descended to the advance Base Camp.

On February 7 a group reached the summit of the Cerro Peñas Blancas (19,750 feet).

Appendix III

DETERMINATION OF THE ALTITUDE OF ACONCAGUA

Having in recent years reached the high mountain zone of the Andean Cordillera between Upsallata and the Chilean frontier in the course of our geodetic field work, we of the Instituto de Geodesia of the Engineering School of the University of Buenos Aires decided to determine the exact altitude of Aconcagua during our 1955 and 1956 geodetic field work. I was accompanied by other professors of geodesy from the Institute, by army officers, students of the Advanced Technical School of the Army (Escuela Superior del Ejército), and graduate students of the Engineering School.

The best method to follow to determine the altitude of the mountain above mean sea level would be to run a geodetic line of differential spirit levels to the summit of Aconcagua, but this would produce insuperable difficulties. It was therefore necessary to carry the line of levels as close to the region as possible and from there to compute the altitude of the summit by trigonometric leveling.

To help in our solution of the problem we already had the precise line of levels of the Instituto Geográfico Militar to the Nodal Point 63 in the Plaza Chile in Mendoza (about 1900 kilometers), the precise line of levels from Nodal Point 63 to Fixed Point 1 in Upsallata made by the Instituto de Geodesia (about 100 kilometers), and the line of levels from

‖ Juan Soltof states the following. "The two summits lie about 65 feet apart but are divided by a deep gap about 260 feet deep, which it would be difficult to cross. The only practical route is to make the whole circuit of the crater, which would involve a whole day's trip. From the Polish cairn we could see that the rock tower was slightly higher." Soltof also spoke of the cards and the broken thermometer mentioned in Rebitsch's article. — H.A.C.

Fixed Point 1 in Upsallata to Puente del Inca made by the Instituto de Geodesia (about 100 kilometers).

In our first effort, following the Quebrada Horcones, we reached with geodetic leveling Plaza de Mulas from Puente del Inca (about 38 kilometers). From there, however, trigonometric leveling (triangulation) would have presented serious difficulties.

We decided to start the trigonometric leveling from the benchmark situated next to the Laguna (Lake) Horcones in the *quebrada* (deep valley) of the same name at about 8 kilometers from Puente del Inca. From that point, some 18 kilometers from the summit of Aconcagua, the peak may be very well observed.

We measured a base line of 1000 meters with an Invar stadia rod and an optical theodolite reading to .2″ of arc. With an optical theodolite reading to 1″ of arc we expanded the base to the 2000 meters diagonal of a quadrilateral bounded by two mountains that flanked the *quebrada.* From all these points the vertical and horizontal angles were observed on the summit of the mountain at different hours of the day.

With the data which we then had at our disposal we completed the necessary calculations to solve the problem, taking into account the corrections which affect the different types of leveling. We corrected the geodetic altitude to the geoide of the benchmark of the Laguna Horcones because of the lack of parallelism of the level surfaces of the terrestrial gravitational field, using values of gravity measured on the geodetic line of levels.

The components of the topographic-isostatic deviation from the vertical were calculated for the benchmark of the Laguna Horcones, the summit of Aconcagua and the two stations separated from them by 20 kilometers at each side. From these data there was determined a profile of the level surface which passes through the benchmark of the Laguna Horcones with respect to the tangent sphere to that surface of level at that point and with respect to which was calculated the trigonometric part of the altitude figure for Aconcagua.

One can therefore relate this part of the altitude figure to the level surface of the Laguna Horcones benchmark. The lack of parallelism between this level surface and the geoide which is related to the geodetic height of the benchmark of the Laguna Horcones was calculated theoretically.

The assembled measurements and corrections have given as the altitude of the summit of Aconcagua:

Height equals 6959.7 meters — 22,834 feet, with a maximum probable error of 1 meter.

Ing. Eduardo E. Baglietto, *Director, Instituto de Geodesia, Engineering Department, University of Buenos Aires, Buenos Aires, Argentina.*

October 27, 1956

Appendix IV

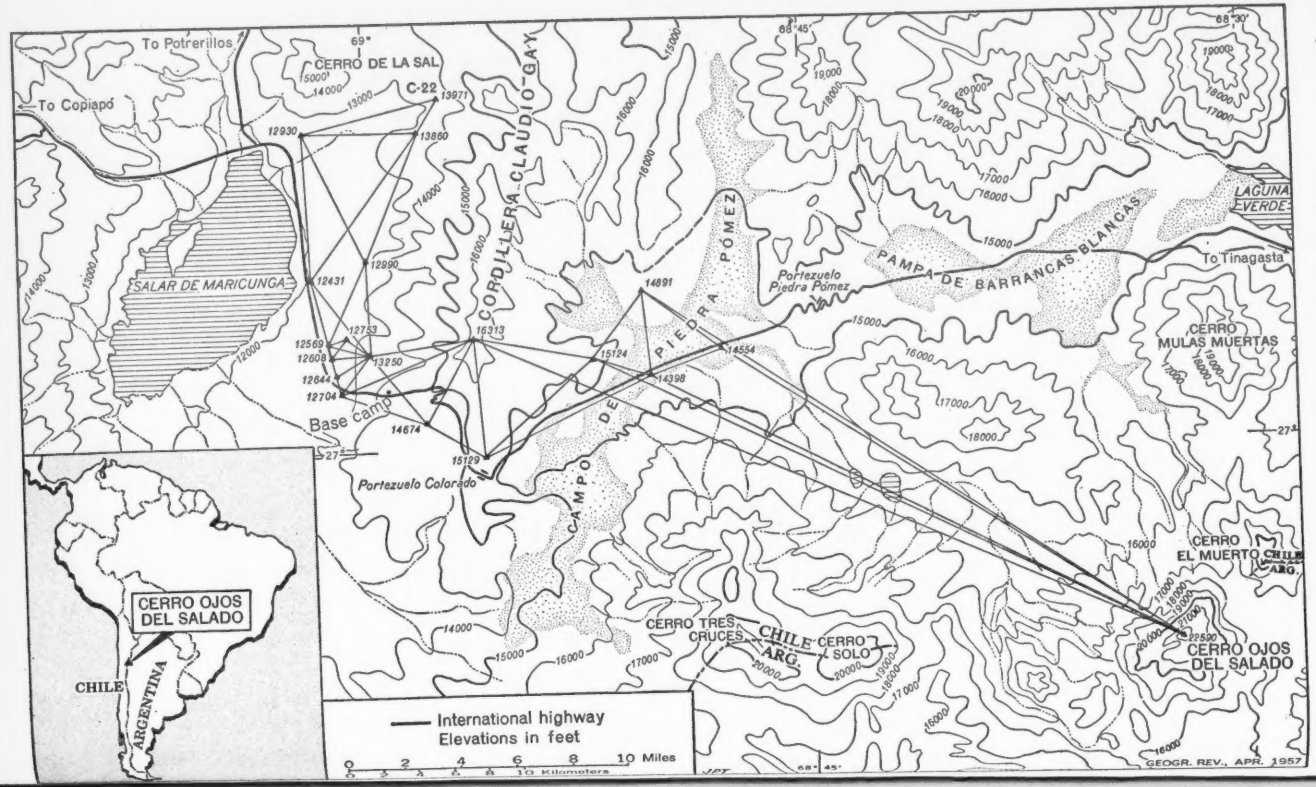
REPORT ON THE ENGINEERING IN CHILE OF AUGUST, 1956, DETERMINING THE ELEVATION OF THE OJOS DEL SALADO

Conclusion: The Ojos del Salado has an elevation of 6885 meters, or 22,590 feet, with a possible maximum error of no more than ± three meters regarding the control connecting the difference in elevation between the established point C-22 and the summit of the Ojos del Salado.

Background: I was first approached in May 1956 for the purpose of establishing accurately the elevation of the Ojos del Salado which rises in the Andean Cordillera above northern Chile and Argentina. At the time there was a great deal of evidence pointing to the possibility of this mountain being higher than Aconcagua, which would result in the Ojos del Salado being the highest mountain in the western hemisphere. Almost nothing was known of the existing local geodetic control except that the nearest known stations were about 200 kilometers from the Ojos over extremely rugged terrain.

However, the large copper mine and smelter belonging to the Andes Copper Mining Company at Potrerillos was noted to be within about 120 linear kilometers of the Ojos. As it seemed quite feasible that an accurate elevation would be established there, the on-the-spot engineering research began at Potrerillos. It was discovered that the Andes Copper Mining Company had located various accurate elevations within about 60 kilometers of the Ojos; therefore, it was only logical that one of these stations be used as a base elevation.

The expedition proceeded to the Ojos region during the latter part of July but after several days was forced to withdraw to Copiapó and on to Santiago because of adverse weather conditions and transport difficulties. During that first trip into the region I was able to develop a reconnaissance plan and estimate that it would be possible, weather permitting, for four people to complete the field control within three weeks.


To Potrerillos
To Copiapó
CERRO DE LA SAL
C-22
CORDILLERA CLAUDIO GAY
SALAR DE MARICUNGA
PIEDRA PÓMEZ
CAMPO DE
Portezuelo Piedra Pómez
PAMPA DE BARRANCAS BLANCAS
LAGUNA VERDE
To Tinagasta
CERRO MULAS MUERTAS
Base camp
Portezuelo Colorado
CERRO TRES CRUCES
CHILE
ARG.
CERRO SOLO
CERRO EL MUERTO
CERRO OJOS DEL SALADO
CERRO OJOS DEL SALADO
CHILE
ARGENTINA
International highway
Elevations in feet
0 2 4 6 8 10 Miles
0 2 4 6 8 10 Kilometers
GEOGR. REV., APR. 1957

A jeep was secured in Santiago and a party of four—Mr. and Mrs. H. Adams Carter, Roberto Busquets, and myself—returned to the Ojos region and completed the field work within just three weeks during the month of August. The work was carried out over extremely rugged terrain at high altitudes under very adverse conditions. The successful completion was made possible only by the tremendous efforts and aid given by the Carters and Sr. Busquets.

Base Elevation: The station C-22 of the Andes Copper Mining Company with an established elevation of 4258.343 was selected as the base departure point.

In 1915 a line of differential spirit levels was run from the port of Barquito (Chañaral) to Potrerillos for the railroad survey. During 1925 the Andes Copper Mining Company also ran a spirit level line from Barquito to Potrerillos for a transmission line survey and rectified the previous Potrerillos elevation by 4 meters. Both level lines were based on mean sea level.

A well-checked spirit level line was carried about 80 kilometers to the water reservoir at La Ola for the engineering of the La Ola-Potrerillos water pipe line.

During late 1955 and early 1956 a further spirit level line was run from La Ola about 30 kilometers south towards the Maricunga salt flat for the purpose of additional water and drainage studies. It was one of these Maricunga level stakes—C-22—which was recovered and used as the base elevation.

Method: A 788.676-meter base line was measured on the Maricunga Salt Flat. From this base line a triangulation scheme of 18 stations was established extending about 15 kilometers north to connect with C-22 and about 22 kilometers south and east to establish five stations from which the summit of Ojos del Salado was visible. Reciprocal zenith observations were made from all stations to establish the individual differences in elevation and non-reciprocal observations from five stations to the summit of the Ojos to determine ultimately the difference in elevation between the Ojos and C-22 by trigonometric leveling and thus the elevation of the Ojos.

Accuracy: The majority of all field work was done under extremely unfavorable conditions, such as snow and ice and high velocity wind- and sand-storms. This, of course, affected the accuracy of the survey. However, the survey is more than sufficiently accurate for the purpose for which it is intended.

Sketch map of the Ojos del Salado region, Chile, showing triangulation network. ***(Courtesy of The American Geographical Society of New York.)***

A Wild T-1 repeating theodolite reading direct to one minute and with visual interpolation to six seconds was used. Five repetitions of direct and reverse were taken on all horizontal angles. Two or three repetitions of direct and reverse were read on all zenith distances. All zenith distances, with the exceptions of those to the Ojos del Salado, were reciprocally observed.

Magnetic north was observed from North Base with a Brunton compass and the result was used as the basis for calculating all bearings.

North Base was assigned the arbitrary coordinates of N 50,000 m., E 50,000 m., from which all other coordinates were derived.

The base line was measured three times backward and forward with a standardized steel tape and all corrections carried out for temperature; tape catenary and sag; set up, set back; inclination; and reduction to sea level. A probable maximum error of 8.8 millimeters exists in the base measurement.

Please note that the base line and, therefore, all other computed lines, is reduced to sea level datum.

A probable maximum error of three meters exists for the calculated difference in elevation between C-22 and the summit of the Ojos del Salado.

Data: All data—elevations, angles, distances, bearings, coordinates, etc., —will be found on the accompanying plan showing the triangulation scheme and relative topography. The topography and road are drawn to sketch accuracy only. (See page 94.)

All detail information—field books, calculations, adjustments, and the original plan on tracing cloth—are in my files in Lima, Peru.

Relative Elevations: Most recent elevation as determined for

Aconcagua	6959.7 m.	22,834 ft.
Ojos del Salado	6885.5 m.	22,590 ft.
Difference	74.2 m.	244 ft.

Peter C. Weaver, Sanchez Carrión 331. Magdelena Nueva, Lima, Peru.

Glacier Studies during the International Geophysical Year, 1957-58

RICHARD C. HUBLEY

THE International Geophysical Year (IGY), 1957-58, has a special significance to glaciologists in that it marks the initiation of glaciology as a major, important branch of the earth sciences. During and following the IGY, the interested layman can expect to read and hear more about glaciers and glacier activity the world over than ever before. It is appropriate therefore to review very briefly the present status of glaciological knowledge, particularly to point out some of the popular misconceptions associated with glacier fluctuations and what they mean, and to state some of the problems of general interest toward whose solution IGY glaciological research is directed.

It is known that at least four times in the last million years, extensive ice sheets have formed and covered much larger land areas in middle and high latitudes than are ice-covered at present. Each of these periods of extensive glaciation, with their successive interglacial periods, was associated with profound changes in climates, vegetation, geologic erosion, soil types, and sea levels the world over. It is not known, on the other hand, what caused these successive ice ages and interglacial periods. We do not even know yet what type and magnitude of change in the general atmospheric and oceanic circulations of the earth would be required to initiate a new extensive ice age, or to dissipate the present continental glaciers covering Antarctica and Greenland. The hypotheses which exist at present as possible explanations of the ice ages and their associated climatic variations are little more than interesting problems in logical reasoning in the absence of the firm, factual evidence.

In order to supply answers to the questions raised above, it is necessary to determine the exact nature of the interaction between the large polar ice masses, and the atmospheric and oceanic circulations. Particularly, we need to know how the ice masses are maintained through action of these circulations and in turn how the present ice surfaces in polar regions affect the world's climates. Meteorological, oceanographic, and glaciological research during IGY in the Arctic and Antarctic will serve to

bring solutions of these problems closer to reality. It may eventually be possible to predict if and when the world will again experience ice ages, or alternatively, if and when the present ice masses will disappear, and what types of climates may then be found in the various geographic regions of the world.

It is known that in the past several decades, alpine glaciers in some parts of the world have shrunk and retreated appreciably, and that these areas in which retreating glaciers have been observed have experienced a general climatic warming. It is not known, however, if this glacier retreat has occurred worldwide in every region where glaciers exist, nor is there sufficient data to tell if the climate of the world as a whole has warmed significantly during these past decades. In the past few years, magazine and newspaper articles have appeared which describe the glaciers of the world as retreating. Authors of these articles sometimes overzealously extrapolate this supposed world-wide shrinkage of ice bodies to a time in the not too distant future when we all shall bask in pleasant tropical climates. Actually, present data on current glacier fluctuations has been sufficient only to draw conclusions about alpine glaciers in temperate regions. Since glaciers of the temperate and equatorial regions of the world altogether make up less than two percent of the total glacier-covered area of the earth, it is not reasonable to extrapolate the behavior of this tiny sample to all of the world's glaciers. Particularly in view of the fact that it is completely reasonable from a theoretical basis to expect that glaciers in the polar regions may not fluctuate synchronously with alpine glaciers in temperature and equatorial regions, it is quite appropriate to say that at present we have no idea at all whether the total glacier covered area of the world is growing larger, or smaller, or is virtually in equilibrium. Because the ice of Antarctica and Greenland constitutes about 95 percent of all the glacier ice in the world, it is hoped that IGY research in these two areas will supply an answer to the present status of the world's glacier cover.

If glaciology were concerned only with amount and fluctuations of the earth's glacier cover as a whole and the effect of this glacier cover on world climates, there would be no point in studying alpine glaciers as such, because alpine glaciers are much too small to affect climate, and represent an insignificant part of the world's perennial ice cover. As it is, however, alpine glaciers fluctuate in size, movement, and extent in response to climatic changes, and also leave clear-cut records of these fluctuations. Alpine glaciers therefore serve to indicate and measure climatic fluctuations in the regions wherein they occur. The relationships

GLACIER STUDIES—*Figure 1.* Coleman Glacier, Mount Baker. *(Upper)* October 21, 1954; *(Lower)* August 19, 1955.

Figure 2. September, 1955.

GLACIER STUDIES—Chocolate Glacier, Glacier Park, Washington.

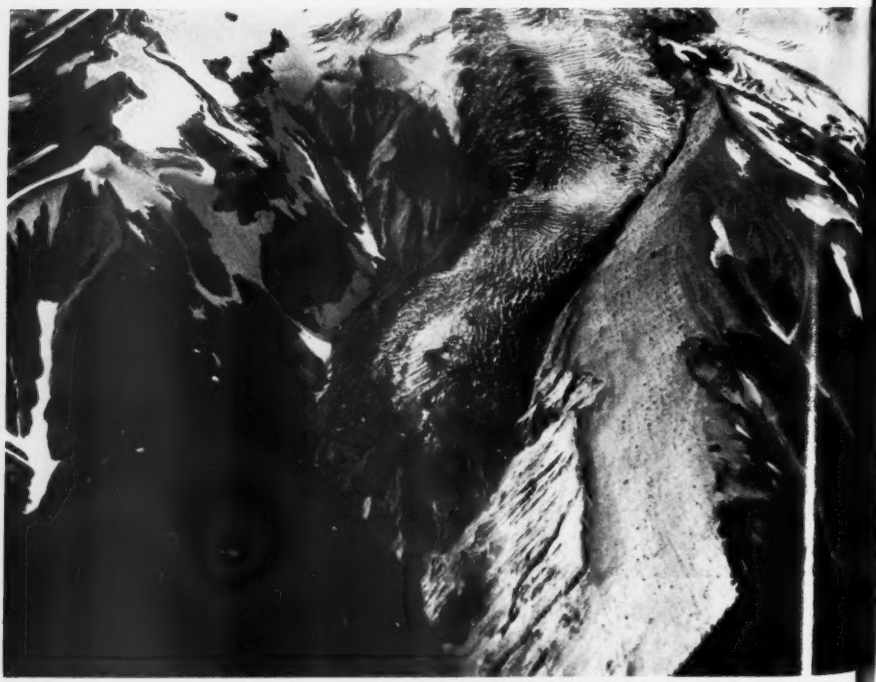


Figure 3. September, 1956.

between successive advances and retreats of these glaciers and associated climatic fluctuations are however, very complex. In order to use alpine glaciers as indicators of climatic change, it is first necessary to establish the physical relationships of changes in climate to changes in glacier mass and energy, and in turn to establish relationships between the mass and energy changes in a glacier to changes in glacier movement and position of the glacier terminus. Studies directed toward solution of these latter problems will be made as part of the U.S. IGY program, during a period including two summers and one winter, on a temperate alpine glacier in Olympic National Park, Washington; and on a polar alpine glacier in the Brooks Range of arctic Alaska.* It is expected that these IGY programs will bring new impetus to the study of glacier dynamics, which will continue after IGY and afford ample opportunity for students with good backgrounds in classical physics and a love for mountaineering to find an absorbing profession in glaciology.

Although as yet we are not able to make complete interpretations of glacier fluctuations in terms of climatic fluctuations, it is still of great importance to collect all possible observations on glacier activity, present and past. This, because, as our methods for interpreting glacier fluctuations in terms of climatic fluctuations improve and become more accurate, data as complete as possible will be needed to reconstruct the climatic history of glacier-covered regions. For this reason IGY also includes plans to make observations of present activity of alpine glaciers. Quantitative data will be obtained on some glaciers by using photogrammetric surveys to prepare successive maps of glaciers over a period of years, from which changes with time in glacier volumes can be computed.

Valuable qualitative data will also be obtained very simply by photographing glacier termini, icefalls, etc., repeatedly over a period of years from fixed marked photo-points near, but not on the glacier. This type of data can easily be collected by non-professionals. Because there are too few professional glaciologists to make observations of glacier activity in all areas from which they are needed, it is to be hoped that as time goes on, and particularly during IGY, more mountaineers will become actively interested in making qualitative photographic records of glacier activity and thereby supply valuable data needed by the glaciologist to obtain a correct picture of glacier activity in various geographic regions.

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* A temperate glacier is one whose mean temperature in summer is at the melting point. A polar glacier is one in which the mean temperature is always below the melting point.

Examples of this type of qualitative observation are shown in the accompanying photographs. Figure 1 shows two composite photos made ten months apart of the advancing terminus of the Coleman Glacier from a single, fixed station. The growth of the glacier terminus is clearly shown in these photographs by the downslope advance of the terminus, the heightened skyline of the ice, and the burial by avalanche ice of rocks appearing in the foreground of the 1954 picture.

Figures 2 and 3 show the lower part of the Chocolate Glacier, on Glacier Peak, as photographed from the air in September 1955 and September 1956. Because they are taken from a moving plane, these pictures do not represent photos repeated from a fixed station. On the other hand, sufficient distinctive features appear in both photographs, particularly around the glacier terminus, so that the advance of the terminus during the intervening year is clearly marked.

A large number of photographs made both from the ground and from the air of glaciers in the Cascades and Olympics in the past few years have allowed the following qualitative conclusions to be drawn concerning present glacier activity in western Washington:

1. Out of a total of 116 glaciers checked by the end of summer 1956, 98 are advancing. The remaining 18 glaciers show evidences of growth, but currently are not advancing, presumably because either they are as yet too thin to move, or because an impulse of accelerated ice-flow originating in the upper accumulation region of each of these glaciers has not yet had time to reach the glacier terminus.

2. The general glacier advance is most pronounced in the northern Cascades, from Glacier Peak to the Canadian border, where some glaciers are advancing at rates in the order of 300 feet per year. To the south on Mount Rainier, glacier growth and advance is pronounced, but less so than in the northern Cascades. In the Olympics, glacier growth is also occurring, but at present is considerably less pronounced than in the Cascades.

These qualitative observations, together with much more technical detailed observations being made on a few selected glaciers in the area are affording a documentation of glacier activity comparable to that which has been obtained for some time in the European Alps, and which it is hoped will eventually be obtained for other glacier areas in the world.

This current advance of glaciers in northwestern United States, along with the recent information that glacier retreat in the European Alps appears to have ended and been replaced by a period of growth suggests that glacier observations in other areas at this time may yield results of

exceptional interest, inasmuch as this may be a turning point in glacier activity in other glacier areas in the world.

Any interested mountaineer visiting an area having glaciers can make a valuable contribution to these studies by observing the following simple instructions:

a) Take photographs of glacier termini, icefalls, lateral contacts between ice and bedrock or moraines, and of peaks or nunataks rising out of the ice.

b) Try to include as many bedrock features in the photographs as possible for identification points.

c) Make a record of the date each photograph was taken, the features appearing in the photograph, the type and focal length of the camera used, and a description of the spot from which the photograph was made. If possible, mark the photo-point with a cairn or other identification so it can be found easily in later years.

d) A list of the photos, or preferably copies of the photos themselves with the above pertinent data should be turned in to the Department of Exploration and Field Research, American Geographical Society, Broadway at 156th Street, New York 32, New York, care of W. O. Field.

Medicine on the Mountain

L. BRUCE MEYER, M.D.*

IN RECENT years our mountaineering journals have recorded the ascents of many previously unclimbed peaks and travels in many unexplored ranges. More and more mountaineering expeditions have taken to the field, and more knowledge has been gathered regarding mountaineering or expeditionary medicine.

Expeditionary medicine is an interesting form of practice which entails the evaluation of the physical and emotional state of the climbers, the organization of a table of supply and equipment, the prevention and treatment of injury and illness, and the study of environmental and occupational disease. This field of play is by choice in a remote area and is usually performed under difficult circumstances. In a group of expeditionary size the need for a physician as a medical officer is definite, especially in the remote areas of the Himalaya.

The problems encountered on such an adventure are many, and the responsibilities accepted are great. So far, there has been very little written on this subject and it is my object here to make certain suggestions that will aid in the planning of future expeditions. An expedition may experience a catastrophe or be medically uneventful, as exemplified by several groups in the Himalaya in 1954 and on Everest itself in 1953.

The planning by the medical officer for the health program and the decisions about the table of supplies and equipment for an expedition into the Himalaya or a similarly remote area depend upon the following factors, briefly listed:

1. Objectives: The considerations may vary depending on whether the expedition is a reconnaissance or an all-out assault on a major peak. In the latter case, the individuals participating may be exposed to a more severe and hazardous climbing environment and thereby to a greater chance of injury or illness.

2. Logistics: There are few mountain areas in the world as remote from sources of supply as the snow peaks of the Himalaya. The problems of portage, additional medical assistance, and supplies are matters that cannot

* This article has been considered and approved by the Medical Committee of the American Alpine Club, of which Dr. Meyer is a member. In substantially the same form it constitutes Report No. 1 of the Committee.

be met easily, since the rough terrain and distances make the time factor a matter of weeks. Furthermore, an evacuation or air drop cannot be planned beyond the Indian-Nepalese border. The medical facilities that may sometimes be reached after a ten-day carry are not always adequate for definitive treatment; hence care must be provided over a long chain of evacuation.

3. Size and duration of the expedition: The amount of supplies carried will naturally vary with these two factors. The usual tendency, however, is to carry too much.

4. Special problems: These may consist of anticipated care of the natives encountered en route, responsibility of care for the expedition Sherpas and porters, if such are used, preparation of a definite plan for the treatment of cold injury, and special attention to adequate means of dealing with acute trauma. Also the problems of tropical disease as well as high-altitude living must be considered. As pneumonia has been so frequent a cause of death on recent expeditions, one needs a clear understanding of its possible etiology and prevention.

With these factors in mind and with the aim of preserving life and health, one may formulate a sound medical program and gather adequate medical supplies and equipment.

Medical Examinations

Prior to a strenuous mountaineering adventure complete physical and laboratory examinations are obviously necessary. The personnel usually appear to be in good health and have had much mountaineering experience. However, the rigors of long treks and living in both tropical and high-altitude environments will preclude a very careful evaluation on the expedition, and a problem which may have seemed minor can, in a mountain wilderness, become a major incapacitating condition. If a climbing party is by necessity small, its strength varies directly with the number who are physically fit. Unfortunately, one's ability to acclimatize cannot be predetermined other than by actual experience at high altitude, but the other factors relating to the physical and emotional state of the individual are of major importance in determining his actual climbing strength when conditions are extremely difficult and physical and emotional stress are great. As climbers frequently depend upon one another for preservation of life, it is vital that none should be handicapped. One handicapped climber in a party handicaps the team.

Medical histories and complete physical and laboratory examinations should be required. Certain conditions have been shown to become aggravated by high altitude and the stress of mountaineering expeditions. A

history of stomach-ulcer symptoms, a chronic cough or respiratory allergy, heart irregularities, and old injuries to the skeletal system should be thoroughly evaluated. These laboratory studies are suggested: complete blood count, urinalysis, Wasserman, blood typing, chest X ray and electrocardiogram.

Immunizations

To insure good health when traveling in foreign countries one should be immunized against the diseases which are prevalent in the area which he will visit. The requirements are set by the U.S. Public Health Service, the American Society of Tropical Medicine and Hygiene, and by the regulations of the Military Air Transport Service. The last requires a certified International Health Certificate before one is allowed to board a MATS plane. World-wide customs regulations, which can be obtained from the above sources, list the exact immunizations required for a specific country. For example, travel in India and Nepal requires immunization against smallpox, typhoid, para-typhoid, tetanus, typhus, cholera, yellow fever, and plague. The smallpox vaccination and the yellow fever inoculations must be certified by the Public Health Service or the Department of Defense. The agents for these immunizations can be obtained from most pharmaceutical houses except for the yellow fever immunization, which can only be obtained at a U.S. Public Health Hospital. A physician must administer and certify the immunizations and of course advise on those indicated.

Medical Supplies

The decision of what and how much medical equipment to include is a difficult one. To predict in advance precisely what will be needed is impossible. But one must try to prepare for any eventuality. The Medical Committee has prepared lists of supplies and equipment to suit various conditions and areas. The most useful items are the antibiotics; and penicillin in disposable cartridge form is exceedingly convenient. Items such as the tetracyclines or Erythrocin are useful and have minimal side effects on the gastrointestinal sytem. If a single antibiotic is chosen, Chloromycetin should be the most practical as it has an exceedingly broad spectrum against many organisms with records showing a low incidence of drug resistance. This is important as sensitivity tests cannot be performed in the mountains. It too has minimal side effects.

The analgesics, such as aspirin and Empirin with Codein, barbiturates, especially Nembutal and Seconal, the anti-malarial Chloroquine, a Vitamin B complex with supplemental Vitamin C, water purification and salt

tablets are also frequently used. A water purification tablet, an iodine compound, under the name of Globoline or Tetride, is more effective than the Halazone tablets. An amoebicide, plenty of material to suppress diarrheas and cough, adequate sunburn cream, a plasma expander such as Dextran, blood-transfusion equipment, and anti-snake venom are other items to be specifically considered depending upon the circumstances. Otherwise the medical supplies should include the stimulants, cardiovascular drugs, local anesthetics, dressings and usual other items that make up a field medical chest.

The outlay of surgical instruments should enable one to remove an appendix or repair a ruptured viscus, decompress an injured brain, install an adequate airway, and manage a fracture of a long bone as well as perform minor surgery of ordinary wounds. Examining instruments, a urethral catheter, a Levine stomach tube, and orthopedic plaster should also be included. Plastic surgical drages are a practical item, and ready Band-Aids are popular with the natives. The performance of the above procedures would of course depend upon the rapidity of the chain of evacuation.

Dental problems, such as repair of fillings, can be performed if a small amount of Zinc Oxide, Eugenol, and Phenol is available, and an extraction may be accomplished with a curved bone rongeur.

If oxygen equipment is to be taken for medical purposes only, a closed circuit apparatus of the Waters "To and Fro" absorber type is practicable. With soda lime, flow-meter pressure gauge and face mask and oxygen cylinders, this will make one good porter load.

Special permission is necessary to carry narcotic items across international borders.

Special Problems

To insure the health of a group traveling in remote areas consideration must be given to certain diseases and problems which are prevalent by nature of the environment. These are the following:

Malaria. Since World War II Chloroquine (Aralan) has proved to be a very efficient malarial suppressive as well as therapeutic agent. It is easily taken once a week as a suppressive agent, starting approximately two weeks before one enters a mosquito-infested area. Chloroquine is not malariacidal on the tissue phase of the parasite, and therefore Primaquine would be an advisable agent to be used in combination or following the Chloroquine. Insect repellents and mosquito netting are necessities.

Dysentaries. Tropical and native areas are commonly associated with diarrheas and diseases of filth, and one should strictly adhere to the practice of *not* eating native food and beverages or uncooked vegetables and dairy products. In essence, military sanitation methods must be practiced. Drinking water must be treated by boiling or by the use of water purification tablets.

Insects and Leeches. Effort should be made to avoid close contact with native dwellings and areas of filth. Food should be protected from flies, and preparation carried on well away from designated latrines. Perhaps leeches are a necessary evil to reduce the high red blood-count of acclimatized man, and their bite is painless, but secondary infections may develop. Repellents are moderately effective when incorporated in water-resistant silicone creams. Tight-fitting clothing around wrists, ankles, and neck is the best barrier.

Vitamin deficiencies. As diets on mountaineering expeditions are not always well balanced, supplemental vitamin therapy is advisable on the longer excursions (over three weeks). The items containing specifically high concentrations of Vitamin B and Vitamin C are most beneficial.

Heat Exhaustion. On both approach and return journeys considerable hot, dry marching may be encountered. Watering places may sometimes be far between, and it is imperative that when traveling in such areas, all carry canteens and use salt tablets for replacement purposes. Occasionally intolerance to salt tablets occurs, and a more suitable method of salt replacement is to dissolve two 10-grain salt tablets in a canteen of water, thus obtaining a concentration of 0.1% to 0.2%, which is usually well tolerated. Under such conditions as much as 12 grams of salt may be needed. The usual daily requirement is 4 to 6 grams. Adding generous amounts of salt to one's food may be sufficient.

Frostbite. The problem of frostbite is one that is not completely understood as there are many conflicting reports in the literature. The injury consists of tissue necrosis produced by severe cold after a sufficient period of exposure. The resulting cellular tissue damage and gangrene is either due to the cold itself or to the physiological response of blood vessel constriction. The latter cause seems less likely. The general condition of the individual as well as his protection at the time of exposure also determine the degree of tissue damage. As the circulating blood is the primary heating system in the body, any decrease in this volume which might occur at high altitude, where severe dehydration exists, would accentuate the process. It is sometimes difficult to tell how much tissue is

affected. Dead tissue may merely appear slightly discolored and have a feeling of warmth imparted to it from the adjacent normal tissue. This is misleading, as one is sometimes overly optimistic about the damage only to observe later that the gangrene has extended.

Of course, the best treatment is prevention with adequate clothing, gloves, boots, oxygenation, food, and fluid intake, and minimizing of fatigue and perspiration. Military experiences in the Korean War and research have resulted in the modern concept of rapid thawing of frozen tissue and abstinence from incurring further tissue injury by brisk rubbing or prolonging the thawing process. Large damaging crystals are prevented from forming in the tissues by rapid thawing, and a marked vasodilatation in the extremity is demonstrated proximal to the injury. This method is carried out by immersing the affected area in a water bath of 55 degrees centigrade, or 130 degrees Fahrenheit. This procedure can usually be performed without difficulty at a high camp with the available equipment of cooking pots and Primus stoves. It should be done promptly.

The treatment may be painful, but pain can be controlled with narcotics. Following this, sterile moderate-compression dressings should be applied to control the edema before it develops. Some authorities advise no dressings. However, some form of sterile protection should be afforded while the patient is being transported. Antibiotics are begun immediately, and the patient should not be allowed to walk if a foot is involved. It has also been suggested that Vitamin C and Rutin be given in 500 mgm. doses. The use of Rutin has been suggested as a prophylactic agent when given in these large doses over the period of exposure, but this is experimental.

Additional methods of treatment, such as dilatation of blood vessels by oral medication or nerve (sympathetic ganglion) blocks and the use of anticoagulants, have not proved especially valuable. The gangrenous area will become fully demarcated after about a month, and no attempt at amputation should be performed earlier.

Individuals vary in their tolerance to cold, and the effect of cold is definitely accentuated at high altitude. A cold-susceptible person, especially one who has had a previous cold injury, would be least able to tolerate cold under these conditions, as would individuals with arteriosclerosis or other vasoconstrictive diseases. Smoking may also have an aggravating effect.

Snow Blindness. The condition results from prolonged exposure of the eyes to the glare of sun- and sky-light and reflected light from snow,

water, and rock. Light rich in ultraviolet creates a burn primarily on the corneal epithelium. The other structures of the eye are involved little. The amount of light necessary to produce symptoms varies with individuals; there may be enough even on a cloudy day. There is usually a latent period of six to eight hours before the symptoms develop. Pain may gradually become intense and incapacitate the individual completely. The dry, gritty, smarting, and tired sensation of the eyes may progress to excessive lacrimation and sensitivity to light. Fortunately, healing occurs rapidly, but may require two or three days in a severe burn. So far, treatment has been limited to the use of a local anesthetic, cold packs to the eyes, and medication for pain. There are no reports as yet in the literature on the use of Hydrocortone for this condition. As this steroid hormone inhibits inflammatory processes and fibrous tissue proliferation, it is a logical choice in such a condition where the main pathological reaction is inflammation of the cornea from a photochemical burn. The result with Hydrocortone Acetate Ophthalmic Ointment when applied early in the course of snow blindness is excellent. Only one or two applications are necessary, and the symptoms are dramatically relieved in eight to ten hours. Though snow blindness is not seen frequently, when it does occur it can be totally disabling, and this method of treatment is excellent. Of course, adequate eye protection from the glare is of utmost importance.

Respiratory Problems. Past experience has demonstrated the marked frequency of respiratory problems, particularly on Himalayan expeditions. The frequency of pneumonia in climbers at these high altitudes has been noted especially. A review of medical histories, as they change from stage to stage on expeditions, reveals how important a part the epidemiological and environmental factors play in the pathogenesis. Himalayan experience is not unique, but it serves as a good example.

A particular characteristic of porters and Sherpas and in fact, of all Nepalese, is their continual coughing and nasal congestion. If you expose men from an entirely different environment to such a group and allow them to live in the unavoidable close contact that exists on this type of an expedition, then what would be expected will happen. Within the first two weeks all will develop upper respiratory infections consisting of minor degrees of inflammation of the nose and throat, sinusitis, and bronchitis. It is obvious that these infections are contracted from local inhabitants, and unless complete isolation techniques are practiced, which is usually impractical, these infections will be spread. This initial "cold" may clear within ten days, and by the time of arrival at a base camp a certain amount of immunity for the remainder of the stay will have developed. If individual

eating and drinking utensils are used the situation may be better controlled. However, most attempts at segregation break down sooner or later and most certainly do so at high camps.

Therefore, individual resistance is important and should be built up over a period of at least a month before any serious climbing on the mountain is performed. During this time initial infections will be overcome while conditioning and acclimatization is progressing at lower altitudes.

Above 16,000 feet the acclimatization process is complicated by other respiratory tract difficulties. The most common is the hacking, sometimes propulsive, minimally productive coughs. Each climber experiences this on gaining higher altitudes, some more than others. There seems no doubt that the explanation for this coughing results from the mechanical factors prevalent in the evironment. The dry cold atmosphere, the relative anoxia, the rapid breathing and dehydration are all causes for irritation of the membranes of the respiratory tract. The windblown dust from a glacier moraine is also a source of irritation. Of these factors the state of hydration seems a very prominent feature. The amount of coughing was noted on one occasion to be the greatest in those individuals who were the least well hydrated and demonstrated the highest urine specific gravities. This brings out again the importance of adequate fluid intake at high altitude.

It was interesting to note that much of the coughing was paroxysmal and propulsive in nature and worse at night, and that a certain amount of voluntary control could be exercised. However, the cough mechanism has been called the "watch dog of the lung," and is essentially an involuntary reflex action to keep the respiratory passage free of obstruction. This violent coughing, whether or not it has organic basis, is certainly traumatic to the throat and lungs in itself.

In ordinary life causes for a cough are many. A foreign body, the inhalation of an irritating substance, an inflammatory process of the respiratory tract, a tumor, allergic disease, cardiovascular disease, tuberculosis, and other pulmonary and extra-pulmonary causes are but a few such disorders.

What happens in the course of events as individuals exist at high altitudes leads one to a clear explanation of the frequency of pneumonia, which has been seen so often. In most of these cases of pneumonia the onset has been relatively rapid, as has the progression of the disease. The environmental factors previously mentioned lead to a retention of bronchial secretions by reduction of the bronchial caliber, by a defective expulsive mechanism, and by changes in the amount and character of the secretions themselves. The bronchial caliber is reduced by congestion and bronchospasm created by the dry atmosphere, dust infection, and bron-

chitis. Bronchial secretions are undoubtedly increased by these factors, but of more importance is the increase in viscosity resulting from dehydration. The maintenance of an adequate fluid intake is very difficult at high altitude, and the insensible loss through the respiratory tract is great. This amounts to approximately one quart of water a day in the normal individual at sea level and must be much above this at high altitude. A minimum of six to eight pints of fluids a day is required. Bronchial secretions are largely of water and contain 6% of solids, of which 3% is mucin. Any increase in the proportion of mucin creates a viscid sputum, which is difficult to cough up and can easily lead to obstruction of the smaller bronchi.

The expulsive mechanism becomes defective because of depressed ciliary action and an impaired cough. Ciliary action in the large bronchi ordinarily propels secretions proximally, but with anoxia, increased viscosity, and congestion, this action becomes ineffective. Further, the action of coughing may be impaired by a chest injury or a pleurisy.

All of these factors lead to a retention of sputum and the great possibility of obstruction within the lung creating a partial or complete collapse (atelectasis) of the lung. This can occur suddenly and be in itself fatal. It will offer an ideal culture medium for organisms harbored by the individual or contracted from others and result in a true bronchopneumonia. Any respiratory embarrassment in severely stressed and fatigued individuals at high altitude is very critical and progresses to fatal termination rapidly.

This experience leads to a plan of management which it is felt will minimize the occurrence of serious complications or loss of time. As has already been indicated, at least a month should be allowed for men to overcome initial infections and condition themselves at lower altitudes. The use of individual utensils and segregation should be practiced as much as practicable. The antibiotics, though having no effect on the initial cold, certainly will control the complicating bacterial developments or secondary infections. The annoying coughs incurred at higher altitudes can be eliminated to a certain extent by adequate hydration, which is most important, and by cough mixtures. Probably sodium or potassium iodide would be the most effective expectorant. A cough suppressant is necessary, especially at night, to allow adequate sleep. The acclimatization above 16,000 feet should progress slowly, and the climbers should remain definite periods of time between successive elevations. It has been noted that as acclimatization improves the degree of respiratory irritation decreases. The development of any untoward symptom should demand the immediate evacuation to lower elevations. Again antibiotics must be available for immediate initiation of

treatment. The oral antibiotics are particularly useful. Oxygen should be available at least for a medical emergency as described earlier. If circumstances permit, oxygen used in climbing would undoubtedly eliminate many respiratory problems. Cigarette smoking does not seem to make any appreciable difference. However, it would be logical to expect that nonsmokers would have less irritation to the mucous membranes of their respiratory tracts.

Acclimatization

Most individuals on climbing to altitudes above 10,000 feet will notice certain symptoms of altitude intolerance. These are shortness of breath, fatigue, loss of appetite, lassitude, headaches, nausea, insomnia, irritative coughs, impatience, depression, and nocturnal muscle-cramps. These symptoms will gradually subside and disappear as the individual becomes more acclimatized. It has been shown that the process of acclimatization to altitudes above 18,000 or 20,000 feet requires between four to six weeks. Definite changes can be demonstrated in the circulatory, respiratory, and endocrine systems.

Certain medications can be very beneficial for existence at the higher altitudes. As proper sleep is a very important requirement, the use of barbiturates such as Secondal and Nembutal in normal dosages will provide the necessary comfort and relaxation. When they are used in this fashion no untoward effects should be experienced. If at all possible and practicable, the individual should return to a lower altitude for sleeping.

States of lassitude and depression have been noted following prolonged living at high altitudes. Certain medications are beneficial in treating these conditions and exert a dramatic effect in lifting the mood and producing a desire for activity. A medication such as Desoxyn, 5 mgm., and Nembutal, 45 mgm., used in combination under the trade name of Desutal prepared by Abbott Laboratories, has been shown to be very effective. Similar products should also have the same effect.

Again it is important to stress that adequate fluid intake above all enables an individual to perform more effectively at high altitude, as does a good diet. Adding extra salt stimulates thirst and increases fluid intake. It has been shown experimentally that in the unacclimatized individual the sodium in the body is depleted through excretion. Sodium chloride is utilized to restore this balance. Sometimes a strong will power has to be exercised to cope with sticky cereal and rice-tuna dishes. Forcing liquids may mean getting out in the night, but there are solutions.

Conclusion

These ideas indicate that a definite medical program is an important part of any major expedition. Sound medical consultation also is advisable on smaller trips in which a physician is not participating. Thus may serious problems be prevented, hazards be minimized, and unnecessary rescue efforts eliminated. There will still be plenty of opportunity for adventure!

Some Icelandic Mountains

KENNETH A. HENDERSON

FROM a mountaineering standpoint Iceland has been much neglected. This is a pity, for the scenery abounds in extensive views, the country is interesting and historic, the people pleasant and extremely helpful, and the mountains most interesting from a geological and glaciological standpoint. In the main the climbs are not technically difficult, except perhaps those few snow climbs where some short stretches of technical difficulty are found. The rock is of volcanic origin and extremely friable so that difficult rock climbs which are justifiable from an objective viewpoint are hard to find. Because of the fine facilities at our disposal last summer, three of us, Frank Gaebelein, Casper Cronk, and I were able to make the ascent of several major peaks of Iceland in late July and early August. The following account may be helpful to others wishing to make climbs in Iceland, as no adequate guidebooks are available.

KERLINGARFJÖLL AND THE CENTRAL HIGHLAND

The Kerlingarfjöll (Carline Mountains) lie on the central highland between the Langjökull (Long Glacier) and the Hofsjökull (Temple Glacier), nearer the latter. They may be reached over a rocky but well-cairned road from Gullfoss (Golden Fall) on the Hvítá (White River) by ordinary car, although care must be used at some of the fords if the weather has been warm and glacier melting considerable. Extra gasoline is advisable, although we managed with only a tankful. There is a fine shelter hut, the Asgarðhús, of the Ferðafélag Islands (Icelandic Tourist Association), located at about 2500 feet on the high ridge between the Jökullfall and the Innri-Asgarðsá River. The Ferðafélag runs bus trips here during the summer, going also to other points of interest on the central highland. The massif is composed of four or five peaks of about 4500 feet altitude with a number of small glaciers, and in the midst is the Hveradalir (Hot Spring Valleys), where the largest group of hot springs in Iceland is located. Somewhat below this, the Innri-Asgarðsá drops into a deeply cut canyon. The 500-foot drop through soft volcanic rock is similar in structure to, although far more somber than, the Grand Canyon of the Yellowstone in Wyoming.

From the refuge hut it is an easy walk up the ridge skirting this canyon to the glaciers of the highest peaks, about four miles distant. Snaekollur (4846 feet) is the highest of the peaks and is a relatively easy snow climb up the east face. A more interesting climb is Loðmundur (4698 feet), just north of Snaekollur. Loðmundur is a distinctive rock peak built in the form of a tower with steep cliffs on all sides. There are several breaks in these cliffs, but the couloirs formed in them are very steep and full of loose scree, which, although useful for a quick descent, should be avoided on the ascent. With moderate difficulty from loose rook, the climb can be made from the Loðmundurskarð between Loðmundur and Snaekollur (Snow Peak). From this same col a series of ridges can be followed to Snaekollur itself, making a pleasant and not too difficult day. We made this trip under adverse weather conditions, reaching the summit in a blizzard. Several other snow peaks may be reached across the glacier on the other side of this pass. Ögmundur and several lower peaks to the west may be reached by crossing the Innri-Asgarðsá above the canyon, although this makes a considerably longer day.

The Hofsjökull is not easily reached by ordinary conveyance and is more suitable for a ski ascent than climbing on foot, as it rises in a great dome-shaped mass. The Langjökull, similarly, is best ascended by ski owing to the long distance. However, one may obtain good ice climbing and route finding through séracs in the icefalls of the Nyrðri and Fremri Skriðjöklar (the More Northerly and Further Sliding Glaciers), two of the distributary glaciers which fall into Hvítárvatn (White River Water). Near this beautiful lake is located the Hvítárneshús, another hut of the Ferðafélag. It was here at Hvítárnes that Hauskold the Priest, of the Njal Saga, lived in the 11th century. The farmland was abandoned after the eruption of Hekla in 1104, when the land became unusable.

Hrútafell (Ram Peak, 4626 feet), lying east of the Langjökull and just north of Hvítárnes, is well worth a visit. It can be approached closely only by truck or jeep. Defended on all sides by high cliffs, it is best ascended by glaciers which drop down through these cliffs on the north and northeast sides. It may be approached also, on foot as well as by jeep, from Hveravellir (Hot Springs Plains), the large hot spring area at the end of the Kjalvegur on its northern side.

HEKLA

Hekla, long associated in the medieval mind as the site of Hell, or at least the entrance thereto, was the favorite objective of most early travelers to Iceland. Its long record of volcanic activity embracing 16 eruptions in the last 800 years has spread its fame far beyond its native heath.

The ascent of Hekla is quite rewarding. For nearly 100 years the usual route of ascent has been from the farm Naefurholt up the south side of the mountain. In the past, horses could be taken high on the mountain to facilitate the climb. However, the eruption of 1947-1948 changed all this. The farm and the valley between it and the mountain was covered by new lava many feet thick. The farm was moved nearer the river, Ytri-Rangá (Outer Crooked River), and although still on the way to the mountain, Naefurholt is no longer used as a climbing base. At Hella, on the main road from Reykjavík to Kirkjubaejarklauster, one may obtain a jeep and driver who knows the mountain. It is only 50 miles from Hella over a reasonably good road to Hekla. As far as Naefurholt the road is generally good, but it is narrow and crosses several deep fords. From there on, four-wheel drive is required, as the way leads through old lava fields and over a number of subsidiary ridges until Little Hekla, on the northwest side of the mountain, is reached. The route skirts the edge of the 1947 lava flows and then goes up the soft cinder slopes of Little Hekla. If the jeep is not too heavily laden, it may be possible to drive several hundred feet up these lower slopes before bogging down. From this spot (*ca.* 1500 feet) it is about a 1500-foot climb to the top of Little Hekla, from which the entire summit area of the mountain may be seen. This part of the ascent is very easy, for the slope is not steep, and the cinders have been consolidated to make good footing. However, the rest of the way is over steep, unconsolidated slag or cinder, or over snow-covered glacier. The latter route is preferable and should be followed wherever possible. Once on the summit ridge, the gradient is easier, and the cinder slopes become less troublesome.

The summit was raised 180 feet by the 1947 eruption and is now 4931 feet in altitude. It is the highest point on the ridge around the northern crater, where the explosion occurred in the last eruption. The entire crater rim and much of the summit area give off a considerable amount of steam and are composed of loose cinders and ash which are warm to the touch and to walk on. From the summit and its crater we went over the ridge to the south along the rim of the central crater, which is about one-half mile long and 100 yards wide. The descent from the peak was easy, with long glissades or simple traverses over the snow-covered glaciers.

SNAEFELLSJÖKULL

Snaefellsjökull (Snow Peak Glacier, 4744 feet) lies at the end of the long peninsula of Snaefellsnes, which, except for a small bit of the great

northwest peninsula, is the westernmost point in Iceland. It is well known to those who have sailed in the Faxafloi to Reykjavík or have spent time in that vicinity, for on clear days the peak's great, gleaming cone of white is readily seen across the 90 miles of foam-flecked water between. In contradistinction to the eastern Snaefell (6014 feet), the glacier-clad peak north of the Vatnajökull between the Jökullsá á Brú and the Jökullsá, it is always referred to with the appellation "jökull" at its end. The mountain appears as a truncated cone with the snow-filled crater broken away on the north side.

With four-wheel drive it may be possible to reach a point fairly high on the east side of the mountain, but we drove the car along the main road and camped on the south side of the mountain near the farm of Dagverdará a few miles from the village of Stapi.

The ascent of Snaefellsjökull is easy and straight-forward from this point. There is a broken subsidiary crater at about 2300 feet on the southeast slope of the mountain. We headed directly for the western ridge of this crater and found the going very good, over grass until near the top of the ridge and then over fairly stable rock. From the little col between the crater rim and the mountain, it was only a short distance to the edge of the glacier at about 2500 feet. Although it was the first of August the ice was covered with a thin layer of snow. There were many small crevasses, but none large enough to impede our progress, and the next 2000 feet was mainly a steady plod over snow to the rock peak on the right side of the skyline ridge. We found that the ridge marked the edge of the crater. The snow and ice fell away steeply toward the north, and the crevasses were much larger. According to the map the rock peak on our right was some 15 feet higher than the great snow summit on the left end of the ridge; so we traversed on steep, rime-covered snow slopes diagonally upward to the northwest corner of the peak where the route looked easiest. From here it was only about 30 feet up almost vertical, rime-covered snow to the top. It was necessary to cut through about six inches of frost feathers into the underlying snow to get good holds. The steepness of the slope made it impossible to stand in the steps without also cutting away the rime and snow between. Progress was slow, therefore, but the distance to the top was not great. The summit view is superb: the sparkling blue of the Faxafloi to the south, the Breidafjördur on the north, and the Denmark Strait stretching toward Greenland on the west. Eastward the hills extended back to the mainland, which was seen dimly in the distance through the dust clouds raised by the winds.

Snaefellsjökull was climbed first by Eggert Olafsson and Biarne Pálsson on July 1, 1754, and has been attempted many times since, often unsuccessfully because of poor visibility and inability to find the summit in the fog. The route which we used, however, can be followed easily by compass with minimum danger from crevasses.

HERÐUBREIÐ

Herðubreið (Broad Shoulder, 5518 feet) is shown as one of Iceland's most beautiful mountains. It is situated near the eastern edge of the Ódádahraun (Lava of Evil Deed), the dreaded lava field which stretches for 100 miles on the northern edge of the Vatnajökull. The mountain is circular in shape and is almost completely surrounded by a double band of cliffs composed of soft and loosely cemented palagonite breccias. Curiously enough, the columnar basalts, the harder rocks which form the real base of the mountain, are covered largely by scree on most sides of the mountain. The cliffs themselves might be climbed if one had enough time to attempt them with the care which they demand, for the rock is exceedingly rotten. However, there is a break in them on the northwest corner which offers a feasible route to the summit plateau. The base of the mountain is about three miles in diameter, while the summit plateau, some 3000 feet higher, is roughly a mile and a half across. The summit plateau is, in turn, surmounted by a volcanic cone on which there is a dead glacier on the northern side. From a distance the mountain thus resembles an extremely broad-shouldered man, from which resemblance it takes its name.

Herðubreið cannot be approached closely by car without four-wheel drive to cross the Jökullsá á Fjöllum east of the mountain and to negotiate the intervening lava flows. This route was used by the 1955 survey party with two trucks equipped with winches to help each other over difficulties. A more usual route with jeep follows the road on the west side of the river, thereby avoiding having to ford this deep and rapid stream, and then crossing the Ódádahraun from either Grafarlönd or Herðubreiðarlindir. This approach makes the ascent possible in a long day from Myvatn (Midge Lake), where good hotels may be found, although a camp at Grafarlöndsá (Cut Lands River) or Herðubreiðarlindir (Herðubreið Brook) would make an easier trip.

We left our jeep at Grafarlöndsá as far up the meadows bordering the river as we could drive, and then headed directly toward the mountain. From here the mountain is about 12 miles distant, and the route of ascent lies around it to the northwest corner. The footing is good for about 10

miles across the lava, but there is considerable up and down. The last few miles around the mountain on the outwash plain is smoother going. The first 3000 feet of ascent is up scree-covered gullies, the upper parts of which were extremely loose. Even climbing some rock ridges didn't help, for the rock crumbled when touched. Some snow slopes, however, were helpful, and we followed them whenever possible. From the top of the gullies there are a few cairns which were erected by the survey party and which lead to the summit. Rather than follow the cairns, however, we headed directly for the summit, first crossing remnants of the dead glacier and then climbing steep ice- and snow-covered slopes on the north side of the summit. Beset by fog as we arrived on top, we soon returned a short distance down the west ridge, but we found the rock rotten and the views through the mist to the lake on the south side disconcerting; so we headed back down the way we had come.

Although we had enjoyed fine views of Snaefells from the Ódádahraun on the way to the peak in the morning and excellent views of the Vatnajökull and Kverkfjöll on our way up the mountain, most of the return trip across the lava fields was made, after a fine sunset at about 10:30 P.M., in a gathering storm, by following a compass course. The round trip covered some 25 miles of walking and 3500 feet of climbing, which with the 100 miles of driving means a very long day. It should be possible to shorten this distance considerably by starting from Herðubreiðarlindir, which is three or four miles nearer the mountain.

ÖRAEFIJÖKULL

One of the most interesting parts of Iceland lies in the remote southeastern part of the island. The Öraefijökull is the high southern extension of the great Vatnajökull, that vast icefield which covers some 3400 square miles of the land. Its name, Wilderness Glacier, is well chosen, for it is separated from the rest of the country by impassable barriers. On the north lies the icefield of the Vatnajökull (Water Glacier), so called because of the severe floods coming from it as the result of sub-glacier volcanic activity. To the west and east are the great stretches of gravel, the Skeiðarársandur and Breiðamerkursandur, crisscrossed for miles by braided streams, deep and rocky or with quicksands. The streams are changing their beds all the time and periodically are subject to excessive flooding by the dreaded *jökullhlaup* (glacier burst). The Öraefijökull blew up with tremendous violence three times in the 14th century destroying the farms in the area, and many other natural catastrophes (floods, advancing glaciers, etc.) have made life hard and have served to breed a special

kind of self-reliance among the inhabitants of this region. This section is now accessible by plane with service twice weekly from Reykjavík to Fagerholsmýri (The Beautiful Hill in the Bog).

The highest point in the Öraefi is Hvannadalshnúkur (Angelica Valley Knoll, 6952 feet), also the highest peak in Iceland. It is situated on the north side of the ancient crater on the edge of the Vatnajökull. Nearer the south edge of the crater rises another high point, Knappur (The Knob, 6073 feet), often attempted but only climbed a few years ago for the first time.

The mountain may be climbed directly from the airfield at Fagerholsmýri. We arranged to stay at one of the farms there and were able to select a possible route for the ascent to the skyline 6000 feet above. The next morning we started at 2:30 A.M., for we knew that the route was long: about 3500 feet of ascent to the glacier front and another 2500 feet over the ice to the skyline. This we reached at 9 A.M. after a nine-mile climb. A close look at Knappur disclosed why it had defied attack for so long. Although the climb was only a few hundred feet, a mean bergschrund cut directly across the only route, and the entire, extremely steep slope was sheathed in rime. From this point we had to cross the crater on a relatively level walk of three miles to the peak itself. Hvannadalshnúkur rises about 1000 feet from the crater's floor, and its slopes are crossed by many crevasses. Although these seemed small from a distance, many proved to be very large and deep, so that a careful selection of route was most important. We reached the summit at noon. The view was extensive, except to the east where clouds hung somewhat below us to obscure the views in that direction. To the north and east over the Vatnajökull we could see for many miles, and southward over the Atlantic the horizon was the only bar to visibility. We started back at 1 P.M. and reached the farm for supper five hours later after a 25-mile round trip and an up-and-down climb of 14,000 feet. The climb could be shortened by staying at the abandoned farm of Sandfell some six miles from Fagerholsmýri, but this would entail walking that distance on the road unless one could arrange for a ride on one of the large trucks which are the chief form of transportation in the area. Hvannadalshnúkur may also be climbed from the Vatnajökull, for it is possible to drive a weasel to within about an hour's walk from the summit from that side. This, however, would require a great deal of equipment and advance planning.

The scenery in this part of Iceland is outstanding. The many glaciers which descend the valleys from the Öraefijökull make it appear more

alpine in nature than any other part of the country. The farms have mostly the old sod houses which are being replaced rapidly elsewhere by cement. The farmers still cut the hay from the rooftops as well as in the *tún*, but each farm has its own electric generator with more than enough water power. Here, where Ingolf first landed and spent his first three years in Iceland and where many of the influential chieftains mentioned in the sagas lived, there is perhaps still retained the finest flavor of the old Iceland which is disappearing rapidly elsewhere.

ASCENTS: Snaekollur, 4846 ft.; Loðmundur, 4698 ft.; Hekla, 4931 ft.; Snaefellsjökull, 4744 ft.; Herðubreið, 5518 ft.; Hvannadalshnúkur, 6952 ft.

PERSONNEL: Casper Cronk, Frank E. Gaebelein, Kenneth A. Henderson.

Everest - Lhotse, 1956

JÜRG MARMET

Translated from the German by H. Adams Carter.

THE two 1952 Swiss Mount Everest expeditions, on the first of which Raymond Lambert with the Sherpa Tenzing climbed to the highest point yet reached, also had serious scientific objectives. The scientists gathered a wealth of material. The following year the Swiss Foundation for Alpine Research planned to send to the region a strictly scientific expedition. However, at that time sufficient financial support and qualified personnel were not available for a completely comprehensive and effective undertaking. Renewed attempts to form an expedition in 1954 and 1955 likewise failed since the scientists in question were mostly busy in the Arctic and other regions.

Meanwhile the mountain climbers had not remained idle. Ernst Reiss was especially interested to reach the yet unattained summit of Lhotse, which he had been able to observe at close range while climbing to the South Col. We were also attracted by the business of climbing Mount Everest, unfinished for the Swiss at least. Even though we had not made the first ascent, we could nevertheless attempt the second.

At a meeting of the Swiss Foundation for Alpine Research in the spring of 1955, called by Ernst Feuz and attended by Ernst Reiss, Albert Eggler, and me, the proposed climbing plans took definite shape. Eggler was appointed expedition leader, Reiss leader of the climbing party, and I the oxygen expert. We succeeded in gathering ten mountaineers who possessed not only the necessary technique and Alpine experience but also the sense of comradeship and teamwork developed by years of climbing. The expedition finally consisted of the following climbers: Albert Eggler, expedition leader (43), Wolfgang Diehl, assistant leader (47), Hans Grimm (44), Hans-Rudolf von Gunten (27), Eduard Leuthold, doctor (28), Fritz Luchsinger (35), Jürg Marmet (28), Ernst Reiss (36), Adolf Reist (35), and Ernst Schmied (32). To this group was added as the only scientist available in the summer of 1956 Fritz Müller (30), from Zürich. He had already proved himself as a geomorphologist in various parts of the Arctic.

The first group of six men left Switzerland on January 28, 1956, traveling by air to Bombay and by train across India to Jaynagar. They

carried the expedition baggage except for the oxygen equipment, which for technical reasons could be shipped only at the end of February. The leader of the expedition, the doctor, and the scientist followed the first group a month later by plane and joined them at the frontier of Nepal. Together our comrades went on foot through the hills and valleys of Nepal by way of Okhaldunga, Namche Bazar, and Thyangboche to the foot of Mount Everest. On April 7 they reached base camp at 17,900 feet, below the great icefall of the Khumbu Glacier. All were held up for some days in Thyangboche by a severe illness (appendicitis) of Luchsinger, which fortunately turned out all right.

On March 5 the last two, Hans Grimm and I, left Switzerland by air. It was our job to travel after the rest as a self-contained unit with the oxygen equipment, which included 190 cylinders of oxygen. At Thyangboche on April 6 we met the doctor Edi Leuthold and his patient Fritz Luchsinger. The latter's health was restored so rapidly, thanks to Leuthold's outstanding medical skill, that on April 14 we were all assembled at the base camp, together for the first time since the end of January.

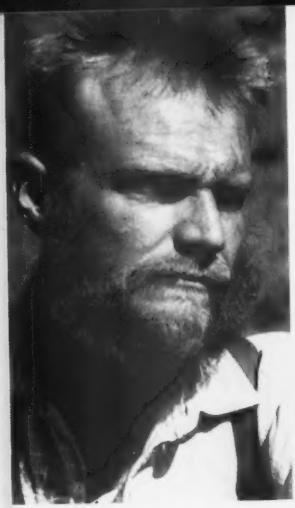
Base Camp lay on a lateral moraine of the Khumbu Glacier right at the foot of Khumbutse. There was sufficient room for the tents used on the approach march and our mess tents. Out of stone we built a roomy kitchen and a sitting room, where in front of the fire we developed many of our plans of strategy. Fritz Müller, our glaciologist, helped build the Base Camp as a scientific center, for he intended to stay there until the end of the year.

On April 8 the first reconnaissance group set about investigating the icefall. Ernst Schmied succeeded in reaching the Western Cwm on April 12, but was unable to avoid one passage that was threatened by falling ice at the foot of the western shoulder of Everest. In vain did we search during the next few days for a better route through the uppermost gaping crevasses. There was no alternative to using this exposed passage. We were truly lucky that we never had the slightest mishap while ascending and descending every day through the icefall. Blasting removed innumerable threatening séracs, which forced us continually to seek for better and safer routes.

Camp I lay at 19,200 feet, about halfway up the icefall. We placed Camp II at 20,175 feet, right where we emerged into the Western Cwm. On April 23 we established Camp III, our advanced base, at 23,325 feet in the Western Cwm. We strove to bring up as much material as possible to this advanced base. Our Sherpas, hard-working, cheerful, and friendly fellows, carried heavy loads day in and day out up the icefall.

MOUNT EVEREST AND THE KHMUMBU GLACIER—from the air.

SOUTHEAST FROM THE SUMMIT OF EVEREST—Makalu at the right.



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THE CLIMBERS OF EVEREST AND LHOTSE.

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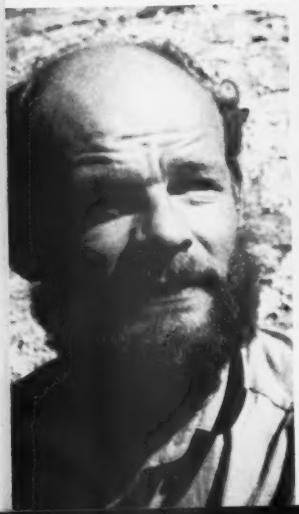


MARMET

VON GUNTEN

We noted with pleasure how our single supply dump continued to grow. As soon as sufficient oxygen equipment had been brought up, there was nothing more to keep us from reconnoitering the Lhotse face.

Camp IV was established on the lowest terrace of the Lhotse face, at 22,800 feet, on May 4. It was time to start using oxygen. The extraordinarily good health of the members of the expedition up to the last day, and very little trouble from frostbite, may to a great extent be attributed to the use of oxygen.

The Lhotse face offered certain difficulties because of its icy condition. At first the route, provided with fixed ropes, led steeply upward over steps cut in the ice, but it became somewhat easier above. On May 6 we considered ourselves sufficiently high, at 24,600 feet, to establish Camp V on a comfortable platform. On the following days Ernst Schmied and Fritz Luchsinger crossed the steep couloir that descends from Lhotse and continued towards the Yellow Band. A difficult, diagonal break in the rocks enabled them to traverse the upper part of the gulley. Together with Sherpas, on May 9 they climbed to the top of the Geneva Spur, where they set up and occupied Camp VI, the Lhotse Camp.

We had made satisfying progress in this first part of May and already had hopes of climbing to one of the summits in the next few days. However, late on the morning of May 10 it started to snow hard, forcing our lead group to descend the avalanche-threatened couloir that same day. When the bad weather continued, all groups were forced to withdraw to the Advanced Base Camp to wait there for it to clear. Some of us even climbed down to Base Camp. The radio report from the Indian weather bureau, declaring that this was the forerunner of a very premature monsoon, caused the barometer of our morale to drop to the lowest point. Was the arrival of the monsoon, nearly a month early, going to bring to nothing all our efforts? As the last straw, our sirdar Pasang Dawa Lama fell ill in Namche Bazar. After an apparent recovery, he returned to Base Camp, where he suffered a serious relapse, so serious in fact that the doctor had to order his immediate removal to lower altitudes. Since our best Sherpas wanted to accompany their sirdar personally back to Namche Bazar, our prospects for a successful expedition were very shaky. Since it seemed unlikely that the sirdar would recover quickly, we transferred this post to Dawa Tensing, who had already distinguished himself on various expeditions, especially on Kangchenjunga.

Late on the morning of May 14 the sun finally burst through the thick gray clouds. Everest, Lhotse, and Nuptse beamed in the blinding sunlight, a light of trust and hope. Loads were eagerly made up in Camp III, our

Advanced Base. In the past few days loose snow had piled up dangerously on the Lhotse face. While the cutting wind swept this in giant banner-clouds onto the Kangshung slope of the South Col, Luchsinger and Reiss ascended again toward Camp V. They failed to plow through to their buried goal in the deep and tiring snow, and it was only on the next day that Schmied succeeded in reopening the way. Meanwhile von Gunten and Reist had reoccupied Camp IV. On May 16 they climbed on up to Camp V, where they felt so fit that they immediately continued preparing the route over the Yellow Band and up to Camp VI. In fact they climbed beyond, to the top of the Geneva Spur, and were the first members of the expedition to look down onto the desolate, uninviting South Col. After a critical inspection of the conditions then prevailing, they descended to Camp V, where they joined Reiss and Luchsinger. The route had been established even farther than it had been before the monsoon had broken.

On the night of May 16 the wind completely drifted all the steps in again. Undeterred, von Gunten and Reist with five Sherpas made a new set of tracks back up to the Lhotse Camp (Camp VI), which they found snowed-in up to the ridge poles. They dug it out and turned it over in a habitable condition to their companions, Reiss and Luchsinger, who had followed them up. Then only did they descend to Camp III for a well-deserved rest, leaving the field to their comrades, who stayed on alone in the cold and bitter wind.

Even while we were making plans for the expedition at home, it had been apparent that Lhotse offered only one vulnerable spot. Although its ridges and faces were defended by precipitous pinnacles and rock steps which could hardly be climbed at that altitude in any reasonable time, the length of the northwest face was cut by a frightfully steep couloir that led directly to the depression beneath the summit. This couloir had already caught Reiss's eye in the fall of 1952. Moreover the International Himalayan Expedition in 1955 had planned their ascent of Lhotse up this gulley. However we had not been able to get a clear idea of the conditions in the middle section of the couloir, either from previous expeditions' reports or from available photographs. Even though generally the avalanche danger seemed slight, we had to be ready for possible surprises. Everything was now ready for them to make their reconnaissance with adequate support behind them, but it was clear to all of us below that our comrades should advance and take the summit by quick assault if the conditions in the couloir were favorable.

Things were bustling early down in Camp III on May 18. It was a brilliant day. We kept our field glasses trained on the Lhotse face, though

for a long time in vain. The howling wind on the slopes of Everest grew noticeably stronger and the drifting snow poured like waterfalls valleywards down hollows and gulleys. From time to time gusts swept snow horizontally over the whole Lhotse face. We knew that a terrific gale must be raging up there in the Lhotse Camp. Nevertheless at half past ten we caught sight of the climbers in the limited field of our binoculars. Laboring against the wind, they slowly beat their way upwards to the lower end of the couloir. Then they rested for a long time on a big rock. Finally they climbed on and at about noon disappeared into the gulley. Any one of us in the lower camps would have been more than willing to relieve our two friends of the task of kicking and cutting steps and of fixing ropes. For the first time we were condemned to leave our companions to their own fate. We were probably more worried about them than they were themselves as they cut their way step by step up the hard snow that lay at an angle between 50° and 60° in the couloir.

After a cold and unpleasant night, the pair had set out at about nine o'clock, unmindful of the violent winds. A few minutes later malfunctioning oxygen equipment forced them to halt. During the night unnoticed moisture had collected in the connecting tube and had frozen instantly when they emerged into the icy air. They tried for a long time to thaw it. Finally they removed repair materials from their rucksacks and replaced the stopped-up tubing. This explained why it was not until eleven o'clock that they had reached the comparative shelter of the couloir.

The technical difficulties, which aside from the extreme steepness were at first not too serious, became greater and greater as the pair reached the midpoint of the couloir. They finally reached the key point, of which we had no previous knowledge. The gulley was interrupted here by a band of reddish rock. For a rope length the snow gulley rose upward only a few feet wide. With hands on both sides, Reiss and Luchsinger worked their way slowly upward, belayed by pitons. The chimney was extremely steep and difficult, but climbable. Finally they could see the upper edge of the seemingly endless couloir. Hopefully they climbed the rock-hard snow, recognizing the neighboring pyramid on the left as the highest point of Lhotse and at last stood below the dismally steep final pitch of the summit cone. The wind tore with renewed energy at their clothing and threatened to rip them from their steps cut in the hard snow. After climbing a band of green rock, they found that only one rope length separated them from the summit. Our watch through the field glasses from Camp III

was rewarded when suddenly the form of the summit ridge seemed to change. We still believed we might be mistaken until two dots stepped off the dark rocks onto the bright white of the snow. Reiss and Luchsinger worked their way up the last rope length to the summit. They completed the first ascent of the world's fourth highest mountain on May 18, 1956, at 2:50 P.M.

While we celebrated in Camp III, our companions stood for some time on the top. The summit cornice was so thin and steep that they could view the imposing expanse of mountains only from a tiny hacked-out platform. They had to be content to touch the highest point with hands alone. After taking a few summit pictures, they descended. (Even at this height you have to consider the mistrust of the world.) Oxygen was exhausted but the masks protected their faces against wind and cold. Towards 6 o'clock they reached Camp VI, which was again completely covered by drifted snow. In the biting cold it took them hours with numbed fingers and toes to make the tent habitable. Early the next morning they descended to Camp V, where the expedition leader greeted them. One can only guess at their feelings of joy, good fortune and relief.

The ascent of Lhotse gave us all courage and inspiration. We just *had* to climb Everest. While Fritz Luchsinger and Ernst Reiss continued their descent that same day to recuperate at Camp III, the howling wind prevented Ernst Schmied and Albert Eggler, who had stayed on in Camp V, from doing any work. Since nearly all the oxygen up high was used up, Hans Grimm and I climbed that same evening to Camp IV to take over the organization of supply. Our excellent state of acclimatization can be seen from the fact that without undue effort I climbed that evening in exactly one hour from 21,325 feet to nearly 23,000 feet. A strong wind was still sweeping the Lhotse face late in the evening, providing us with grim prospects for the next day.

On the morning of May 20 the raging of the wind on the cliffs of Everest ceased. Day dawned cloudless and clear, perfect for the preparation of the assault. We climbed again and, as it turned out, for the last time up the Lhotse face to Camp V. On our arrival, we found that with his Sherpas Ernst Schmied was already reopening the route to the Lhotse Camp. We hurried forward to join him with as large a supply of oxygen as possible as well as the tents and food needed to establish Camp VII.

The next morning, May 21, we set up oxygen equipment for the Sherpas. Towards noon Albert Eggler and I, with several Sherpas, climbed towards the South Col. Because of the cross-wind at the Lhotse Camp, which was continually being drifted in, we decided to carry Camp VI

onto the South Col itself. While doing so, I had the luck to be the first this year to reach the Col and the old camp of the English and the Swiss. For half an hour I stood completely alone in the middle of this gripping desolation, struck first by the singleness of this occasion, where I would tread only once in all my life, and then by the previous history of this world-famed speck of earth. The tent frames still standing but robbed of their sheltering cloth, the confusion of the objects that lay about, and the scudding wisps of cloud painted a picture of loneliness, despair, and foresakenness. Yet there, still 3000 feet above me, soared the slender pyramid of Everest.

After Ernst Schmied and Albert Eggler had arrived with the Sherpas, we pitched the tents with ease in the complete calm and were just about to crawl into our sleeping bags when we realized to our horror that the Sherpas had left all of the fuel at the Lhotse Camp, that we had no food whatsoever, and that the bag with the Sherpa oxygen equipment had remained on the south side of the Spur. To make matters worse, the four Sherpas who had stayed up with us went on strike and threatened seriously to descend to Base Camp and to leave us to our fate. We finally managed to persuade my Sherpa Pa Norbu to climb back with me over the Geneva Spur and to fetch at least the Sherpa oxygen equipment so that we could give the mountain-sick porters the soothing gas. All around lay heaps of Meta fuel, left by the English, and also a filled Primus stove. The food which had lain there for three years was in perfect condition. Therefore we could spend one day without further supplies. It was a wearisome way to the old Lhotse Camp and back again, for Pa Norbu and I climbed heavily laden without oxygen. Every twenty yards we set our loads down and panted for breath. We sank into the deep snow; every unrhythmical motion brought on a fit of gasping. Albert and Ernst melted sufficient water, about six and a half quarts, for us three. I worked until late at night, examining the English oxygen cylinders that lay about and provided those that still had oxygen with the necessary attachments to make it possible for us to use them with our equipment. There was not much left, but we did find enough in the cast-off cylinders to be able to sleep for two nights with one liter per minute.

When we awoke on May 23 it was snowing. A momentary feeling of doubt seized us. Towards noon, however, the sun forced its way through the mist and we could see that above us the weather was excellent. The four Sherpas made another trip to the old Lhotse Camp and fetched the necessary fuel, food, and oxygen for the assault. Again we inspected everything; the indicator on the pressure gauge of each oxygen cylinder

read 250 atmospheres. Then our column, four Sherpas, Ernst, and I, set off for the steep couloir that would open the route to the South Summit for us. Ernst Schmied, taking on himself as always the hard work of kicking and cutting steps, climbed rapidly ahead. We left the steepening couloir by the rocks to the right of it and two and a half hours after our departure stood by the remains of the bivouac tent in which Lambert and Tenzing had slept the night before they reached their highest point in 1952. The blue sky emerged from the mist, and from time to time when a corridor opened in the sea of clouds, the summit of Lhotse gleamed forth. The wind had, however, picked up and blew powder snow into our faces. Although the Sherpas found this "No good, no good, sahib!" and wanted to leave us, we finally persuaded them to climb an hour higher.

At 5:30 P.M. the ever-increasing gale forced us to camp. A little to the left of the crest of the ridge, at about 27,500 feet, half way between the Swiss camp of 1952 and the English one of 1953, we found a favorable and somewhat sheltered spot. We were able to remove enough snow and rotten rock to set up a Lyon tent.* While the Sherpas descended to the South Col, we climbed into our sleeping bags, fully dressed in mountain trousers, sweater, down trousers and jacket, wind suit and fur boots, pulled our bivouac sacks up to our chins and adjusted the oxygen apparatus. Knowing how essential oxygen was to keep us warm at this altitude, we used it as much as possible while resting.

Outside the gale howled and lashed the snow against the tent. The powder penetrated through every flaw and saved us the worry and bother of going out to get the most important ingredient of our evening meal, snow to melt. Coffee, tuna fish, and crackers made up our supper. We were hardly hungry but made up for food by drinking as much as we could melt on our Butagas stove. We talked about the mountains at home, about climbing, about swimming, and about memories of our youth. Late at night, between wind squalls, we opened the zipper a little to look out at the cloudless skies and far south over the many sleeping valleys and hills of Nepal. The clouds had disappeared. Icy cold night and wind had taken over. We snuggled down, shivering, into our sleeping bags and said good night although we knew that sleep was impossible, for outside the gale, howling in all tones, tore at the tent walls. The tent flapped and snapped, and the snow scudded across only a few inches above our heads. If the tent ripped, it would be a matter of life and death and our chances would be slight. If the oxygen equipment failed, our means of

*A French tent manufactured in Lyon. The other tents in use were Wico and Jamet tents, named for their designers.

keeping warm would disappear and we would be threatened with freezing. If the storm held on, we should soon run out of fuel and food. Yet we felt not entirely alone. In the lower camps our companions were keeping watch, ready to stake their lives, if necessary, to save ours. I knew that our doctor, Edi Leuthold, would not sleep a wink all night. Thinking thus about our friends was reassuring. But what about the weather? I already felt the boundless disappointment we should feel of we had to climb down from here. One must take fate as it comes. Moreover, an ascent is not the "ne plus ultra"; life has higher goals.

With such thoughts I finally fell asleep to dream of home, of sitting in the best restaurant in Zürich and eating a juicy beefsteak, cream pastry and coffee, until I awoke with a colossal appetite. It was 2:30 A.M. Ernst groaned that he, too, was awake. The snow had drifted so heavily onto the tent that it pressed on his body and would hardly let him move. His oxygen was exhausted and he was suffering from the lack of it. After changing cylinders for him, I removed his air mattress plug to let him down where he could have room enough to breathe. Thus we awaited the dawn.

It was light enough at 4 o'clock to drag myself out of my sleeping bag to shovel the tent clear. As I opened the zipper, the howling wind drove a great fountain of snow into the tent. Below us lay the Lhotse face and the Western Cwm. We could even see out as far as the Indian plains. The prospect of a lovely day made the unpleasant decision to crawl out easier, for the sun was already striking the summit of Lhotse. Makalu and Kangchenjunga glowed in the reddish light of the life-giving sun. Soon its warmth would force its way over the ridge to us.

For two and a half hours I shoveled the snow away from the tent with the top of a tin can, though it seemed more like a half hour. We wanted to prepare breakfast, but found that our gear lay buried under the snow in the front part of the tent. It would take at least an hour to dig out gear and food and another hour to melt snow and heat water for coffee. We knew that we had no extra time and said to ourselves that we should often be able to eat breakfast, but could climb this mountain only once; the summit of Everest was certainly worth one missed breakfast. Without a word we packed our possessions and were ready.

We climbed for an hour over easy but loose rock. The crampons bit well and we advanced fast. What luck! How kind the weather was being! We stripped off our down suits and climbed on in sweater and parka. Still a few wind squalls threatened our balance and nearly choked us with flying snow. We parried them with heads bent low and ice axes driven in. At about noon, after climbing a sharp snow ridge and then an extremely steep but

not difficult rock arête, we sat down to rest behind the cornice of the South Summit. To the southwest, toward the Indian plains, clouds boiled and whirled. Huge thunderheads ascended like atomic mushrooms into the blue heavens. The sea of clouds rose higher and higher and soon wisps flew past us. Far below lay pulled-out glaciers with gray-green lakes embedded on their surfaces. In the distance marched row on row of endless hills as far as the eye could see.

During our climb to the South Summit we had been using four liters of oxygen per minute. Just below that point we had removed our oxygen cylinders with still 400 liters in them and replaced them with new ones. To save oxygen, we put the regulator back to two and a half liters per minute as we started towards the final ridge, but this reduction was so noticeable that we had to make frequent halts. Soon a glance at the gauge and a quick calculation showed that with the favorable wind conditions we did not have to be so economical and could confidently use the normal amount. The only problem was the freezing of the oxygen valve at the bottom of the mask. We had doubted its efficiency before leaving Switzerland, knowing the trouble the French had had on Makalu, and were sufficiently forewarned to remedy its inadequacy with replacement parts and a pocket knife.

Before us rose the world's highest ridge, leading to the "Third Pole." Great cornices, overhanging the cliffs to the right, made the ridge threatening and uninviting. We could assume that the snow, like snow on all ridge tops, would be so windblown and hard that we could advance with relative ease. After another quarter-hour of climbing we saw that our assumption was correct. Rope length after rope length, we hacked our way upward as far from the cornice as possible. When we could, we climbed the rocks, happy to be approaching the summit so fast. The wind was only moderate. I was aware even then that this was one of the pleasantest ridge climbs I had ever undertaken. Not because it was the highest mountain in the world; no, simply because of the climb itself. On one side we gazed into the boundless expanse of Tibet and on the other onto the surging sea of clouds, a moving scene we could never expect to witness in the Alps.

All this time we were approaching the final, steep rock bastion. The ridge rose abruptly here for about 65 feet in two steps. The rock was solid and good, but the holds were somewhat small. On the Tibetan side a huge cornice hung far over space. We risked the cornice to bypass the first step. Ernst kicked deeply into the fairly hard snow. With his left hand on the rocks he worked himself slowly higher and higher. Even if the cornice should break off, not much could happen to us, for I had wedged myself

behind an excellent block of rock and was belaying my companion carefully. Only for an instant did we trust to luck when I took a picture. It seemed too risky to bypass the second step by means of the cornice, so we worked our way upwards on tiny holds in the rock. Finally, astride the steep rock ridge, we shoved ourselves along until we could stand again.

Step by step we cut our way up the bare ice slope towards the summit. To the left we looked 8000 feet down onto the tiny tents of Camp III; to the right the huge ice formations of the eastern slopes disappeared into the abyss. With oxygen we had ascended as effortlessly and fresh as if climbing at home. Suddenly the gigantic northern precipices fell away at our feet; we stood on the "roof of the world," the highest summit on earth. It was 2 o'clock in the afternoon.

Our gaze reached into cloudless Tibet, along the never-ending course of the Brahmaputra and on into the blue heavens above the horizon some 300 to 500 miles away. Here and there a white, snow-covered peak rose above the brown sea of hills. We saw no path, no hamlet, no life; it was a dead land. The inaccessibility of this tremendous country, which stretched still farther beyond the horizon, gave us a feeling of unreality; it was an open look into a forbidden land. To the south seethed the monsoon clouds. To the east we could see the famous 8000ers: Lhotse, Makalu, and Kangchenjunga; in the west the proud pyramid of Dhaulagiri. We whiled away nearly an hour, gazing around us, taking photographs and marveling. Our stomachs growled horribly, but we could do nothing for them since all our food had been buried under the snow during the night. What did that matter anyhow!

About 3 o'clock we started down, wrapped in the dark gray of the mists. We left the extra oxygen cylinders where we had changed them, hoping they would help our comrades who would try for the summit after us. As a matter of fact, we met Dölf and Hansrüdi at Camp VII. They had the wearisome task of digging out and repitching the tent, which was drifted in to the ridgepole and badly torn in three places; we hardly envied them. Since I ran out of oxygen at that point, we continued on downward, hoping to make up the deficiency at the South Col. We arrived there at 7 P.M. only to discover that all oxygen had been carried higher. Even so, we slept peacefully and deeply; what could happen to us now?

The next day we labored exhaustedly over the Geneva Spur, still without oxygen, and reeled down the Lhotse face to Camp III, satisfied and happy, for we had reached our long-sought goal.

On the same night that Ernst Schmied and I slept the deep sleep of the blessed on the South Col, Hans-Rudolf von Gunten and Adolf Reist

hardly closed their eyes in Camp VII. Until late they worked in the bitter cold to fix the badly ripped tent. Luckily it was windless or else the pair would hardly have left the bivouac the next morning safe and sound. Following our tracks of the day before, they reached the summit of Everest at 11 o'clock. Rarely had we had such perfect and windless weather on the whole expedition. Two hours later they began the descent and at 4 o'clock stood with the others (Luchsinger, Reiss, Leuthold, and Müller) on the South Col.

On May 31 the whole group left Base Camp and in Namche Bazar and Khumjung spent two days of celebration, wet in more ways than one. Then with the monsoon in full sway we trekked through the hot, humid valleys and hills of Nepal back to Katmandu. On July 8 we all arrived back home in Switzerland with the single exception of Fritz Müller, who continued his scientific studies on the Khumbu Glacier until the end of the year.

Our group had experienced months of untarnished comradeship. We had spent unforgettable days in a land once strange to us. Four of us had stood on the top of the highest mountain in the world with an indescribable feeling of happiness, a feeling that is reserved for a mountaineer and can only be understood by one. However, it is but now, months later, that we are slowly beginning to be aware of the reality of this experience, an experience that comes but once in a lifetime.

Summary of Statistics

ASCENTS: Lhotse, 8501 m. (first ascent), May 18, 1957; Luchsinger, Reiss.

Everest, 8848 m. (second ascent), May 24, 1957: Marmet, Schmied; (third ascent), May 25, 1957: von Gunten, Reist.

PERSONNEL: Albert Eggeler (expedition leader), Wolfgang Diehl, Hans Grimm, Hans-Rudolf von Gunten, Eduard Leuthold, Fritz Luchsinger, Jürg Marmet, Ernst Reiss, Adolf Reist, Ernst Schmied, Fritz Müller.

The Kangchenjunga ascent viewed from Darjeeling

ANDERSON BAKEWELL, S.J.

SELDOM in mountaineering history have such favorable conditions been granted for observing a large-scale expedition on a major Himalayan peak as that on Kangchenjunga in 1955. Not only does Kangchenjunga arise within full view of a well-known hill station but the upper section of the proposed route stands clear and unobstructed across 45 miles of intervening hills and valleys.

Realizing the possibilities, Father Maurice Stanford, S.J., Rector of St. Joseph's College, at North Point, Darjeeling, made preparations well in advance. The loan of the nine-inch Newtonion-type reflector telescope was requested from the observatory at St. Xavier's College, Calcutta, also in the charge of the Jesuit Fathers, and this was immediately sent up. Because of the re-routing of rail traffic since the partition of India, and the possible danger of damage in transshipment at the Ganges Ferry, it was thought safer to send the instrument by air from Calcutta to Baghdogra Airport, near Siliguri, whence it could be transported by lorry to St. Joseph's College. The mirror was accordingly removed to be carried personally, and the six-foot instrument carefully crated and sent by air transport. When I arrived on April 27, the telescope had been mounted in a small room on the top floor of the University Department, and final adjustments had been made by Father Polet, S.J., of St. Mary's College, Kurseong. Dr. Evans' party was on its way, so we had only to wait until the climbers should appear on the snow shelf visible above the Talung Saddle (21,402 feet).

Durga Das, of Darjeeling, had supplied an enlargement of an excellent telephoto of Kangchenjunga taken from Jalapahar above Darjeeling. On this the proposed route was drawn and put up to guide telescopic observation. This was very necessary, as the eyepieces of higher magnification gave such a small field of view that it was disconcertingly easy to get "lost" on the vast slopes. This difficulty was enhanced by the fact that the telescope's mounting, although excellent, was a temporary affair and was therefore not capable of delicate adjustment.

The difference between theoretical considerations and practical application was found to be considerable. Mathematical calculations giving magnifying power and resolving power were quoted by the pundits. But these, of course, were in the ideal order, which in astronomical work could be more nearly approximated by directing the telescope at an angle of 45°, or more, to the horizontal, in order to traverse as little as possible of the enveloping blanket of the atmosphere in observing celestial objects. When the instrument was directed along a plane inclined only slightly above the horizontal, through 45 miles of atmosphere constantly agitated by valley winds and eddies, already heavily charged with premonsoon moisture in late May, the situation was different.

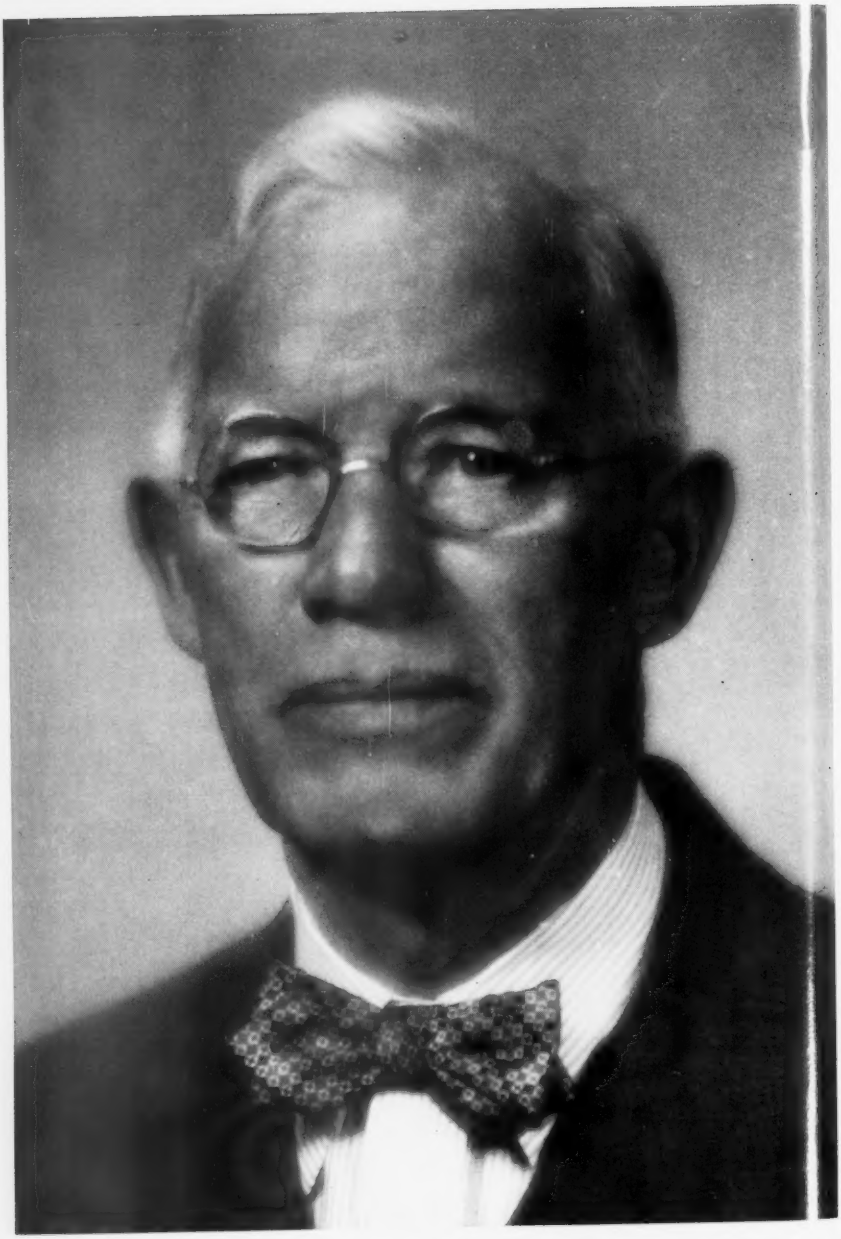
In addition, there were other factors. The telephoto by Mr. Das had been taken in November with a J. H. Dallmeyer variable lens at maximum 52-inch extension. It is an afternoon photograph, with the shadow from the ridge extending from the Talung Saddle to the Southeast Peak of Kangchenjunga being cast to the east and obscuring details on the south wall below this summit. Towards sunset the shadow cast by the ridge rises, so that a photograph taken later in the day would show the whole south wall east of the South Ridge of Kangchenjunga in shadow. In May, when the sun is at a higher latitude, the condition is aggravated and the shadow is cast to the west at sunrise, completely obscuring the route from above the snow shelf to the West Col and on to the true summit. This occurs just at the time when atmospheric conditions are best for observation. As the sun rises, and the shadow recedes to reveal the route, towards 0800 o'clock heavy clouds begin to rise from the intervening valleys, until by 0830 the view generally becomes obscured. At this time of year, of course, the mountain is usually shrouded in cloud for the remainder of the day. There was thus only a very brief period allotted for daily observation. From mid-May onwards, though careful watch was kept, conditions steadily deteriorated.

Given the conditions under which the observations had to be made, the next question was what one might expect to see. The first thing, obviously, was the tents. If these could somehow be located, the problem of finding the men and following their subsequent movements would be simplified. Here again the problem was complicated. In the late premonsoon season snowfall at altitudes within the range under observation was to be expected. This should normally occur during the night, covering the tents and keeping them concealed until sometime after the recession of the shadow cast by the South Ridge. By this time (about 0830) the view would be obscured by clouds.

In spite of these difficulties constant watch was kept. Father L'hoir was frequently at the telescope by 0530; later on he was replaced by others. On several occasions the students were brought in for a look. Among them was Tensing, Angtharkay's young son, now studying at St. Joseph's. The ordinary procedure was to follow the proposed route from the snow shelf upwards with the eyepiece giving the greatest field of vision. Likely objects were then examined with the eyepiece, giving greater magnification but a correspondingly smaller field of vision. This routine was carried out on all possible days.

On May 23, Father Gales, Principal of the University Department, and I were watching together. At about 0815 I picked up four objects that had not been seen on previous occasions. These were located along the projected route between the snow shelf and the summit at an altitude of about 25,000 feet. They were situated just to the east of what has come to be called "Sickle Rock" from its likeness to that object as seen from Darjeeling. The instrument was kept in position, and eyepieces (up to No. 6), giving more powerful magnification, were tried. These, of course, magnified the atmospheric irregularities, which at that time had begun to increase, so that conditions for observation were not of the best. Despite the most optimistic hope, I could not then rule out absolutely the possibility of the four objects being blocks of ice or rocks brought down in an avalanche, the track of which had been obscured by a subsequent fall of snow. Little distinct color contrast with the snow appeared, so that if they were tents, they had recently been covered, and the morning snow had not had time to melt. Their position along the route, the fact that there were four objects, and their altitude on the mountain at the time of observation were all in favor of their being the objects we sought. However, it seemed prudent to withhold comment until further observations could be made.

For us this chance never came. But that same day I had occasion to see Mrs. Henderson, Darjeeling Secretary of the Himalayan Club, and from a sketch sent in by Dr. Evans' runner I was able to identify the objects as having been Camp V. Naturally, this was a source of great rejoicing on our part, not only because at the time we realized that the team was well on its way toward the goal, but because our own instrumental work had been successful. No mention of this was made at the time because the results had been confirmed from information deemed confidential, which was not to be divulged until the conclusion of the attempt on the mountain, which took place two days later.



ALBERT H. MacCARTHY—1876-1956.

In Memoriam

ALBERT H. MacCARTHY
1876-1956

Albert H. MacCarthy, who died last October after an illness of more than a year, was one of the most rugged mountaineers of our time. At forty-eight and forty-nine he led the reconnaissance, winter freighting trip, and first ascent of Mount Logan, 19,850 feet, second in height only to Mount McKinley in North America—twenty-six weeks in the field.* At fifty he made 101 ascents in the Alps in 63 elapsed days—45 climbing days—leaving a trail of temporarily exhausted professional guides behind him. He had gone over to see the Alps, but soon decided that he didn't care as much for the life and climbing there as in our West, so characteristically made the most of his one season and never returned.

Mack was born in Ames, Iowa, son of Cornelius G. and Laura Barnes MacCarthy. After attending public schools in Nevada, Iowa, and in Des Moines, he entered the United States Naval Academy in 1893, where he was awarded the Navy Athletic Association sword for excellence in athletics, graduating in 1897. He was secretary of his class at the time of his death. After ten years of active duty he resigned his commission, shortly after his marriage to Elizabeth Larned. He then tried his hand in the textile field, the law, banking, real estate, and hotel operation, returning to the Navy for active duty during World War I. He was happiest, however, on the large ranch which he and his wife developed in the Windermere valley, in British Columbia. There they spent much of their time for about twenty years, up to about 1930. In 1932 they returned to Annapolis, where Mack found congenial occupation in operating Carvel Hall, and in work with the S.P.C.A. to better the lot of animals, to which both he and his wife were devoted. After her death, in 1944, he turned more to civic affairs, Historic Annapolis, the Anne Arundel General Hospital, and the local radio station (WNAV), but still with time for the welfare of animals.

It was during the years of ranch life in British Columbia that both Mack and his wife found love of the mountains. Here he met the well-known guide Conrad Kain, as well as W. W. Foster, then with the Canadian Pacific Railway, with whom he formed a very close friendship. In the nearby Purcells, the MacCarthys, with Kain, made numerous first

* "The Mount Logan Adventure" by Allen Carpé, *AAJ*, 1933, 2:1.

ascents, including Farnham, Farnham Tower, Commander, Jumbo, St. Peter, Ethelbert, Eyebrow, and many others. In the Selkirks, Mack led the first guideless ascent in one day of the Northwest Ridge of Sir Donald. Later, again in the Purcells and Bugaboos there were more first ascents, including Howser and Bugaboo spires, as well as exploration. In the Canadian Rockies there were many ascents, both with and without Kain. In 1913 MacCarthy, Foster, and Kain made the first ascent of Mount Robson. Their route on the north side was not repeated for forty years. In 1916 came the first ascent of Mount Louis, near Banff, again with Kain. There followed the war interval, a return to the ranch, and more climbing, including the first traverse of Mount Assiniboine, in 1920, with A. W. Wakefield and me. In 1923 he became interested in Mount Logan. His last climbs were Mount Logan, in 1924-25, and his single, comprehensive season in the Alps, in 1926.

The *Canadian Alpine Journal* and other alpine journals contain many accounts of MacCarthy's climbs; The *American Alpine Journal,* founded after the close of his climbing career, contains only the obituaries for his wife and for W. W. Foster. He was a member of the Alpine Club, and an honorary member of the Alpine Club of Canada, the Appalachian Mountain Club, and the American Alpine Club. The last he and his wife had joined at the same time in 1915.

Mack was a firm and resolute leader of the Mount Logan party. He held council most frequently with his close friend Foster. Some members of the party chafed at what they felt was too rigid leadership. Mack had learned discipline through his naval training and felt that a degree of such control was required with this party which had never worked together before. There was some sentiment for "rushing" the mountain instead of proceeding in more orderly fashion from well-stocked camps at the various stages. His plan was undoubtedly the sounder, but there was unfortunately a feeling of resentment by some of the party. Mack always felt badly about this, I know, but to my knowledge he never harbored ill feelings toward the others in later years — he was just sorry that they had not seen things his way.

Mack was not old in spirit. He once said that he had "discovered" the secret of perpetual youth. On the voyage to New Zealand, finding himself just east of the 180th meridian the day before his fiftieth birthday and west of it the second calendar day thereafter, the next day, he decided that as he had had no fiftieth birthday he could therefore never become older than forty-nine. Many years later he said that he was enjoying his fiftieth year thoroughly.

The circumstance of living for twenty years in British Columbia and doing most of his best mountaineering in Canada had made him rather more of a figure in the Canadian than in the American Alpine Club; at least he was better known there than in his own country during his active climbing career. He was a familiar figure at the A.C.C. summer camps for many years and one of the most active climbing-leaders. Mack was a careful, safe, and considerate leader on a climb. He gave the less experienced climbers behind him complete confidence that they would get safely and enjoyably up and down, which they always did. He and his good friend General Foster continued to come to the camps, not annually, but very frequently, almost to the end for both, though neither had climbed for many years.

HENRY S. HALL, JR.

EDWARD CUSHING
1903-1956

Edward Thomas Francis Cushing was born September 19, 1903, in New York City, his mother being German. He went through a public grade-school in New York and attended Horace Mann School for a short time, but this completed his formal education. His informal schooling, however, continued throughout his life, and in his maturity it would have been difficult indeed to find a better-educated man.

His first job was that of office boy in the old magazine *Town Topics,* where, because of his interest in music, he was sometimes delegated by the critic to cover musical events. Later he became assistant in the music department of the *Brooklyn Eagle.* During the illness and after the death of the chief critic he took over the first chair temporarily, and did so remarkably well that in spite of his youth (twenty-three years) he inherited the job permanently. He remained with this paper until its sale in 1938; but during the last three years he was first, editor of the Sunday Magazine, then foreign correspondent with headquarters in Zurich, Switzerland. It was during this period that he did most of his climbing in the Alps, although he had made a beginning in 1926-27. In 1926 he married Mary Watkins, a writer and a member of the music staff of the *New York Herald Tribune.*

On his return to America in 1939 he took a position with the Columbia Gramophone Company as artistic advisor and public relations assistant, and at the same time established a retail bookshop in New Canaan, Conn. At first the latter was a mail-order business devoted exclusively to works

on mountaineering, exploration, and related activities. At the outbreak of World War II he enlisted in the Office of Strategic Services and occupied executive positions both in Washington and in London, later being transferred, to his intense delight, to Berne, Switzerland. Part of his duties, in this service, was the supervision of broadcasts to Germany, in the German language, by the singer Marlene Dietrich and others.

At the end of the war he returned to New Canaan and proceeded to develop his book business into that of a general retail bookstore. This throve so well under his excellent management that, with the great increase in volume, he found it necessary to give up the mountaineering end of the business and in 1954 disposed of his stock in this category to the Old Settler Bookshop, owned by Mr. R. Kolvoord, in Walpole, N.H. The demands of this business limited greatly his opportunities for mountain climbing, but he managed quite regularly to join a group engaged in making ascents of the White Mountain peaks, including Mount Washington, in midwinter. He was elected to the A.A.C. in 1941 and served on its Council in 1947-49.

Two years before his death he became consultant and translator-editor for the newly-founded Angel Records, in addition to carrying on his steadily expanding book business. He had a very considerable literary talent, which he exercised all too infrequently, but it found charming expression in some of the translations of German operettas which he made for Angel. Mention should also be made of a volume of symphony notes by the music critic Lawrence Gilman, which Edward Cushing edited, with the addition of much excellent material of his own.

He died on May 10, 1956, in consequence of an operation. By his special request the text, "I will lift up mine eyes unto the hills, from whence cometh my help," is cut on his headstone, under a medallion reproducing his bookplate, namely, a wild mountain peak with a lyre superimposed.

Edward Cushing was a delightful companion, both outdoors upon a climb, and indoors for a talk. I think, the most delightful Miriam and I have ever known.

ROBERT L. M. UNDERHILL

WILLIAM DEGENHARDT
1902-1956

The many friends of Bill Degenhardt were saddened and shocked to learn of his passing on November 15, 1956. A lifelong outdoorsman

and member since 1950, he had been hospitalized on October 31. He was born in St. Petersburg, Russia, but had lived in Seattle since 1921. He was employed in the public works office of the 13th Naval District headquarters. In addition to membership in A.A.C., he belonged to the Canadian Alpine Club, and was a past president of The Mountaineers, in which he held membership for 30 years. He also belonged to several professional engineering organizations. Bill was long active in mountain rescue work, and was vice chairman of the Mountain Rescue Council. He was himself brought to safety by members of the Mountain Rescue Council when he was injured in a ski-mountaineering accident in the Cascades in 1954. He is survived by his wife, Mrs. Stella Degenhardt, a son, Thomas A., and his mother, Mrs. Anna Degenhardt, all of Seattle.

No one who knew Bill as a friend and companion will ever forget his quiet humor, his unassuming manner, and his unselfish character. Bill passionately loved the mountains in all their moods and at all seasons of the year. He was an ardent skier, a skillful and experienced climber, and an enthusiastic photographer. He was always ready to respond to the call of duty, placing service for others before any personal considerations. Those who have been associated with Bill as a climber, skier, and photographer, although mourning his passing, cherish the rich memories of his companionship.

GEORGE R. SENNER

JOSEPH WILLIAM ANDREW HICKSON
1873-1956

A member of our club since 1910, pioneer in the Canadian Rockies, and formerly professor of psychology at McGill University, Dr. Hickson died suddenly at his home in Montreal on April 22, 1956. Noel Odell, en route from New Zealand to England, called his house that morning, only to be told that he had died a few hours previously, having been apparently well the day before.

I first met him in the Canadian Rockies about forty years ago. Both before and since that time he had been climbing with Edward Feuz, with whom he made about thirty first ascents during the years 1905 to 1930. He began climbing in 1900 in the Alps, where he had some five seasons interspersed with seventeen seasons in the Canadian Rockies and Selkirks. His first ascents included: Pinnacle, Mount Douglas (*White Douglas*), Chephren (*Pyramid*), Sir Douglas, Joffre, Fifi (near Louis), Spring-Rice, King Edward (with Howard Palmer), Bastion Peak, Fryatt (also with

Palmer), Throne Mountain, Castle (now Eisenhower) (new route, by E face of SE tower), Robertson, Cataract Peak, and about as many more in the Canadian Rockies, as well as Moloch, in the Selkirks. For many years he was troubled by a leg injury as a result of being rolled-on when his horse floundered in a bad place on the trail. Despite a bowed leg, he continued to climb when many people would have stopped, but he was finally forced to give in at the age of 57, though he did visit the mountains in two or three later summers.

He was born and lived most of his life in Montreal. His father, Sir Joseph Hickson, was at one time president of the Grand Trunk Railroad. He graduated from McGill in 1893, winning the gold medal in mental and moral philosophy. He gained his master's degree in 1897, and his doctorate in philosophy, in Germany, in 1900 after studying at the universities of Berlin, Freiberg, and Halle. He was on the faculty at McGill from 1901 to 1924, teaching both psychology and philosophy, and for the last 13 years as professor of metaphysics and logic. He had a brilliant and independent mind and did not always agree with his associates, a fact which contributed to his rather early retirement. In later years he interested himself in various charities, also in the Art Association of Montreal in an executive capacity, and later was made honorary president of the Montreal Museum of Fine Arts.

From 1924 to 1926 he was president of the Alpine Club of Canada. He edited the *Canadian Alpine Journal* from 1928 to 1930. In 1954 A.C.C. made him an Honorary Member. He also belonged to the Alpine Club (London), and was a Corresponding Member of the Appalachias Mountain Club. He always valued his membership in our club highly, and the additional associations with our members, several of which were maintained actively to the end. In 1926, Hickson and Howard Palmer, then presidents, respectively, of the Alpine Club of Canada and the American Alpine Club, and both, incidentally, bachelors, made five ascents together, including Mount Fryatt. Accounts of Hickson's climbs always appeared faithfully in the various journals; and for *Appalachia,* February 1926, he wrote a history of "Mountaineering in the Canadian Alps, 1906-1925."

Hickson was an unusual and stimulating person. His observations about people and situations were interesting, penetrating, and often witty. He held certain opinions and attitudes which were often rather original and different, but he was one of those men with whom it was as much fun to disagree as to be in complete agreement. He could say the most surprising things with a straight face and then not laugh until you did. He was a

conservative in some respects and pretty far from it in others. He was a rare personality. We shall greatly miss him. He is survived by a brother and two sisters.

HENRY S. HALL, JR.

JEAN ESCARRA
1885-1955

Jean Escarra was born in April 1885 and died in August 1955. He was an eminent French jurist, specializing in various branches of the law and allied subjects, and held many professorships. These were mainly, of course, at Paris, but he exercised his extensive knowledge in other parts of the world as well, for he traveled widely, particularly in China. In Egypt he aided the commission for codification of the law; in Ethiopia the emperor gave him charge of the codification of commercial law.

Escarra served in the war of 1914-18 and was mobilized again in 1939. In August of 1940, however, in order not to be associated with the armistice, he left France for England, where he soon felt the certainty of ultimate allied victory. His efforts to convince the Vichy Government of this having proved fruitless, he joined the Free French Forces in England. For nearly five years he worked with them either in charge of their foreign affairs or himself serving as the ambassador of Free France in China, at Chung King.

In the field of mountaineering, he was for several years a distinguished president of the Club Alpin Français. He took a leading part in furthering the first French Himalayan expedition, that to Hidden Peak in 1936, and was one of the founders of the National Committee for Himalayan Expeditions, of which he later became president and finally honorary president.

Many members of the American Alpine Club had the pleasure of meeting Monsieur Escarra when he visited the United States in 1931. In 1932 the Club made him an Honorary Member.

MIRIAM UNDERHILL

Climbs and Expeditions

EDITED BY H. ADAMS CARTER

UNITED STATES

Washington

North Arête of Mount Stuart, Cascades. Mount Stuart, a huge granite peak, soars to 9500 feet above the Cashmere Crags and the country of Ingalls Creek. Most of the previous ascents were made on the south face. The north face was climbed once, by Helmy Beckey and H. Strathdee.

On September 8, 1956, Fred Beckey, John Rupley, and Donald Claunch drove up the North Fork Teanaway road towards Mount Stuart, talking enthusiastically about attempting the northeast face, a great wall hidden away on the back of the mountain. Helmy's route was to the northwest. That night we hiked over the pass to the head of Ingalls Creek to get our first view of the mountain, a massive conglomeration of great blocks of granite, rising beautifully in the last rays of the sunset. We camped as far up the valley as we could, built two fires and in the cold tried to get a night's sleep.

Early next morning we crossed two westerly spurs descending from Mount Stuart. After a long grind over boulder fields and heather, we eventually reached the crest of the higher ridge. Dropping down several hundred feet, we obtained our first good view of the north face. It was a splendid, high-angle face, quite alpine, which rose about 2000 feet above the Stuart Glacier. Much of the rock looked firm, but in places, such as Helmy's route, it seemed rotten. On the left skyline was a fine narrow ridge rising above the glacier, which apparently divided the entire north face, although we could still not see beyond onto the northeastern portion. Still hoping to reconnoiter and if possible climb this northeast side, we dropped below the main section of the Stuart Glacier. We found that it would be necessary to drop another 1000 feet and to climb back up a steep, broken icefall. Having little time, we gave up these plans.

We retraced our steps and crossed to the eastern side of the glacier, where John and I decided to give the north arête a try. Fred was unfortunately not feeling well and agreed to meet us on the other side after the climb. The route looked possible, but we had considerable misgivings about a great gendarme or buttress near the top. We reached the rock after crossing an ice tongue and climbed diagonally upwards through a narrow

couloir. Soon John clambered over the crest of the arête. From there we had a full view of our abandoned route to the east. Hardly a worse-looking face can be seen anywhere in the Cascades. Rising above the jumbled icefall, a series of gaunt cliffs and slabs soared upward for 2000 to 3000 feet; climbable perhaps, but not very appealing. Happy in that we had chosen this ridge in the middle of the big rock-face, the only sensible route, we donned our rock-climbing shoes, strapped our boots and axes onto our packs and climbed rapidly, not wishing to be benighted. The rock was excellent as we climbed upward over pitch after pitch of class 4 rock, with occasional walls requiring pitons. The arête was so very narrow and exposed on both sides that we often had to straddle it. It was not too long before we reached the base of the buttress. For the last three hours clouds had been coming in over the western Cascades, but we did not suspect that they would bother us, since the eastern skies were clear. Within a bewilderingly short time, however, Stuart produced a cloud cap and almost immediately it began to hail. Returning would have been as difficult as continuing on up the last 600 feet. Our only hope was to climb around the right base of the buttress. After rappeling down a very steep slab, we soon found ourselves on a catwalk ledge. We traversed upwards and over a tiny ledge system, which required occasional pitons on the rain-covered rocks. Our zigzag ascent brought us onto the summit at 4 P.M. It was still hailing and we lost no time getting down in improving weather.

DONALD CLAUNCH

The Temple, Kangaroo Ridge, Cascades. On September 29, 1956, Fred Beckey and Donald Claunch decided to go to the well-known but seldom-visited Kangaroo Ridge area, north of Methon Valley. We drove from Chelan to Twisp and thence up the Twisp River to Gilbert, the end of the road. Next day we climbed through brush and up spotty trails above the main valley leading to Copper Pass. Fred and I planned to try the great couloir on the spectacular wall of the south face, a route I had attempted previously. We hiked to the base of the ridge that connects with the eastern face of the Temple and upwards for a few minutes through brush, heather, and boulders to a point near the crest of the ridge. Here we traversed south along a wide ledge to the corner between the south and east faces. Fred started up the steep, slabby corner, but was soon confronted with a very smooth section of it, a pitch which I had led free without aid in 1953. After getting that "shaky feeling on discolorations," Fred retreated to let me have a try. Although he had discovered a piton crack, as I retraced this lead, I soon found myself quivering also. I finally managed it with a sling

for direct aid. Once above this touchy spot, I went left across a slab and into the "great chimney," where Fred joined me on a chockstone platform. Fred led up vertically through the steep and rotten chimney, with one piton for safety. Above this we were confronted by an extremely steep, seemingly impossible corner between two large, smooth walls. To our great surprise, Fred found an almost-hidden chimney between the two incoming walls. With pitons for safety, I wormed my way upward. We were soon directly below the summit and some scrambling on moderately difficult rock brought us to the top. This completed the fourth route to the summit, one on each side of the mountain.

DONALD CLAUNCH

North Face of Liberty Bell, Cascades. Towards the end of August, 1956, Hans Kraus and John Rupley packed up Early Winters Creek in the eastern Cascades, above Lake Chelan, to attempt a route on the north face of Liberty Bell. A brief reconnaissance confirmed reports of interesting rock routes. Our camp, immediately below the face, was ideally situated for enjoying the unique beauty of the area and for studying the climb. At daybreak we stepped virtually from our camp onto the face. After about 400 feet of easy rock above a small snow patch below the center of the face, we entered a couloir leading another 400 feet diagonally up and to the right. The first roped pitch was a short, slightly difficult climb out of the couloir over poor rock. After a 150-foot traverse back towards the center of the face, two fifth-class pitches led to the top of an inside corner. Another lead, up and to the right, brought us to a flake, requiring about 20 feet of direct-aid climbing before a second inside corner could be reached. The succeeding 150-foot pitch up this corner was deceptively difficult, requiring about eight stirrups. An easy ledge brought us to the minor summit, from which we traversed to the top. About 700 feet of roped climbing are required by this route, with the north face totaling over 1000 feet. Liberty Bell offers numerous sixth-class routes, the north, east, and west faces all allowing probable direct-aid climbs of varying difficulty; the peak is perhaps more attractive in that the normal route, from a high south notch, is fifth-class.

JOHN RUPLEY

The West Black Butte, Cascades. During the past summer the first ascent of the West Black Butte, Mount Lincoln, was accomplished by a group comprised of Fred Beckey, Wes Grande, John Rupley, and Herb Staley. The Black Buttes are crumbling volcanic arêtes that flank the western slope of Mount Baker, visible from Seattle on a clear day and familiar landmarks to climbers and skiers in that area.

We left Kulshan Cabin campsite at 4:30 A.M., July 22, after a fitful night marked by the pre-dawn exuberance of a large group assaulting Mount Baker. We climbed the lower moraine, crossed the snowfields bordering Coleman Glacier, and reached the crumbling spine of Heliotrope Ridge at 6 A.M. A reconnaissance made in 1946 failed us there; the impressive north flank of the Butte was effectively separated from us by the 1500-foot-deep gulf of the spectacular Thunder Glacier. Much valuable time was lost at that point while we alternately scouted the broken cliffs for a way down and discussed the greater wisdom of basking amid lupine and fireweed for the day. A dubious route was finally found, involving an interesting glissade over decayed slabs, gravel, and muddy snowfields below the glacier. After brunch and a brief sun bath we embarked upon a steep two-mile traverse along debris-strewn snowfields beneath the west face of the Butte. We were rewarded upon reaching the south slope by attractive heather meadows aflame with flowers and tiny residual glaciers. There was a magnificent panorama of the red peaks of the Twin Sisters range to the southwest.

After a brief reconnaissance we were in unanimous agreement that the south face presented the only logical approach to the upper mountain. As seen from below, the West Butte presented a vast forest of lava rock in various stages of decay. Above the steep glacier at its base was a maze of dark gullies veined with snow and capped by four towers of seemingly uniform height. Because of the difficulty anticipated and the impending race against time, we decided to rely on Beckey's 1946 reconnaissance and proceed up the largest gully toward the crown-shaped tower second from the left. After ascending the glacier, we were on rock. A rounded step 100 feet high and exposed to the depth of the moat below required a few cautious moments, after which we traversed upward to the left for some distance over rotten slabs and short littered steps onto the softening snow of a parallel gully. The hollow echo of falling rock above revealed the presence of an anti-social billy goat within 300 feet of our summit choice.

Summoning pride, and because of the lateness of hour, which precluded anything as technical as expected, we decided to abandon most of our drills, bolts, slings, and assorted hardware and to rely on good fortune plus the common sense of the aforementioned goat. We ascended the gully as rapidly as possible for more than 1000 feet on loose snow and rock approaching 55 degrees in angle. The gully was guarded effectively by loosely assembled walls on either side. At 1 P.M. we reached a narrow skyline col above the north face. We turned to the left, 150 feet below our chosen summit tower. Clouds had gathered in the depths below and had

begun to well upward upon a cold wind. Through veiled windows in the clouds we could look briefly to the spot on Heliotrope Ridge where we had been that morning, and beyond to Coleman Glacier with the ant figures of climbers descending. The next 150 feet, requiring great caution, was climbed singly over loose blocks, a 40-foot rotten stemming chimney, and an exposed narrow crack of reasonably solid rock. The top of the tower proved interesting in that it revealed the presence of the true summit 80 feet higher and separated by a troublesome 40-foot gap which required a rappel plus a fixed rope on the return. The summit tower was exposed, but apart from uncertain rock, not as difficult as anticipated. At approximately 3 P.M., well chilled and cheated of a view, we emptied a sardine can as a register and affixed a jaunty red ribbon to our cairn.

The descent was a race against oncoming dark, spiced by rockfall and handicapped by the great caution required on the steep unprotected snow. A final rappel onto the glacier was followed by an interesting glissade and the long, unhappy slog back over Heliotrope Ridge to Kulshan Cabin. The round trip required more than 15 hours. Had greater difficulty been encountered, the climb would not have succeeded. The elevation of the West Butte is 8500 feet, although on at least one map it reads more than 9000. Basically, the climb is a problem in route-finding, but the attendant hazards more than compensate for any lack of technical difficulty. None of us would care to repeat the climb or to recommend it.

HERB STALEY

Wyoming

Northeast Face of Disappointment Peak, Tetons. In mid-July, Willi Unsoeld and Richard Pownall made a new route of severe difficulty on this remarkably smooth face. After a few rope-lengths up the east ride of Disappointment Peak from the notch above Amphitheater Lake, they traversed out on the very broad ledge which cuts across half of the face about halfway up from the bottom of the face. From near the end of this ledge, three hours of direct-aid climbing were required to pass the first pitch. The difficulty of the remainder of the 500 feet of climbing did not perceptibly decrease. Although not entirely direct aid, the climbing remained constantly severe until the crest of the east ridge a short distance from the summit was reached some ten hours later.

LEIGH ORTENBURGER

South Face of Symmetry Spire, Tetons. The Teton Range, in general, and Symmetry Spire, in particular, have been so thoroughly climbed in

recent years that one might think that nothing important remains to be done; prior to 1956, there were nine different routes and four variations on Symmetry Spire alone. Yet in early August, Richard Pownall, Willi Unsoeld, and Norman Lee succeeded in climbing the entire direct South Face, a new route. The importance of this new climb is that it touches neither the Southwest Ridge nor the Durrance Ridge, the boundaries of the face. The older "direct" route, established in 1950 by Pownall and Ortenburger, joined the Durrance Ridge after ascending about two-thirds of the face. The new route started well to the west of the 1950 route, the difficulty having been only moderate until a four-foot ceiling overhang was reached. In the interest of directness, this was attacked over the center through the use of direct aid and stirrups. Above this obstacle, the principal problem was to avoid being forced out to the Durrance Ridge after crossing the ledge connecting this ridge with the Southwest Ridge. The crux of the climb came in the last pitch, the prominent overhang to the left (west) of the last pitch of the Durrance Ridge. Pownall required two hours to make the demanding lead up over this overhang.

LEIGH ORTENBURGER

Devils Tower. Climbing every day during "Mountaineer's Week" in July of 1956, rock climbers from 13 states, France, and Switzerland made 81 ascents of the Devils Tower in northeastern Wyoming. The climbers were invited by the Wyoming Mountaineers of Casper College, to this 50th anniversary commemoration of the establishment by President Roosevelt, in 1906, of the first national monument, the Devils Tower. The massed assaults on the Tower clearly demonstrated to more than 15,000 visitors that climbing is a safe sport for those who are trained for it.

Although six new routes were *driven* up the Devils Tower this summer, bringing the total to ten, the Durrance and the Wiessner routes remain the only ones which have been climbed without the use of tension and the direct aid of acrobatic rope-engineering. Under the impetus of this climbing celebration, more mountaineering ascents of the Tower were made during 1956 than in all the previous years, and more ascents in one week than in the first 25 years of climbing there.

American Alpine Club members, who led or organized eight of the ten teams, climbed on seven of the eight days of the event, and included: Mary Sylvander, Henry A. Waldrop, Robert W. Swartz, Walt Bailey, Henry C. Hoyt, Wilber F. Arnold, Harold F. Walton. Climbing teams also represented these groups and clubs: U.S. Army Mountain and Cold Weather Training Command, Wyoming Mountaineers, Appalachian

Mountain Club, Wyoming Outing Club, Los Alamos Mountaineers, Colorado Mountain Club of Denver, Colorado Mountain Club of Boulder, Iowa Mountaineers, and the American Mountaineering Association.

ALBERT W. BAILEY

California

Joshua Tree National Monument. There is a variety of rock climbing to be found in this large Southwestern desert preserve. Here one can climb on large tumbled piles of monzonite and granite or upon individual boulders which rise from 30 to 150 feet above level ground. Some "individuals," including the Old Woman and the Gateman, near the Hidden Valley campgrounds, have long been popular with Sierra Club groups. West of Twentynine Palms, in Indian Cove, there are high rocks used for practice climbing by the Air Rescue Command, while our local group has found class 3 to class 6 routes on Indian Head Rock, also easily reached from the town.

Some of the more spectacular rocks cannot be climbed without direct aid. A few years ago, Rod Smith and Phil Smith made two attempts to reach the top of the Pope's Hat, a massive pointed boulder in Split Rock Valley, but were turned back for lack of piton cracks near the summit. Later Rod and Don Cornell made a successful effort by driving three studs and moving up in stirrups while under rope tension. Following this ascent, Cornell and John Merriam visited the Lost Pencil and used 13 studs to climb the flawless 60-foot summit block. On a repeat climb which I accompanied as a guest, we re-used the anchors to put Merriam on top and there joined him by quick ascent on a Prusik "ladder." The "ladder," which consists of two parallel taut lines with a Prusik stirrup mounted on each, makes this sort of direct-aid climbing easy and efficient. Tension, too, can be alternated in either line to assist the climber in getting over obstructing bulges and overhangs. On this occasion we also found a "new" retractive rappel quite handy for bringing up cumbersome equipment to the base of the summit block.

In recent months, Rod Smith, R. J. Boyle, and John Davis have made numerous new ascents. Headstone Rock, a curved balanced boulder which might have been difficult even with studs, was climbed by resorting to a tricky cord-throw over its top and then carefully pulling a fixed line into a favorable position.

PHIL D. SMITH

Arizona

Spider Rock. In March 1956 Mark Powell, Don Wilson and Jerry Gallwas, all Sierra Club members, made the first ascent of Spider Rock, an 800-foot sandstone spire in the northeastern corner of Arizona in the Canyon de Chelly National Monument. Although it is difficult to compare it with Yosemite granite climbs, it would be proper to classify it as more difficult than Castle Rock Spire and easier than the Lost Arrow Chimney or the north wall of Sentinel Rock. The actual ascent involved nearly 600 feet of climbing on relatively sound sandstone and involved about nine pitches of mixed fifth- and sixth-class climbing. The route lies on the east side of the spire and proceeds for 120 feet up the great chimney which separates its two summits. At this point a bolt was placed to enable the leader to make a short traverse onto the main spire. About 125 feet higher the route leads into a shallow, dark cave. In a large overhang above this cave were placed approximately ten bolts. More sixth-class climbing and two short chimneys brought the party to a large ledge at the 400-foot level on which a rather cool bivouac was passed. The following day the route led up three more pitches, mostly fifth class, in a wide crack bisecting the east face. We reached the summit at 1:40 P.M., March 30, 1956. About 25 to 30 bolts were placed, most of which were left in place. Future parties should find these useful, but should not count on finding them all as solidly fixed as we left them. Hardware in sandstone weathers fast. Parts of six days were spent in making the climb, but much of the time was passed in sitting out what the weatherman chose to call "damaging winds." Actually about 30 hours of climbing were involved, which included Prusik time to the high points. It is quite possible that the ascent can be made by a strong party in a day's time, but weather and season will play an important part.

JERRY GALLWAS

Alaska

Northern St. Elias Range. The Sierra Club's St. Elias Expedition, led by Alfred W. Baxter, had as objectives the peaks at the head of the Wood and Brabazon glaciers: Mount Wood, 15,880 feet; Mount Craig, 13,250 feet, and several unnamed peaks between 13,000 and 15,000 feet. On August 19, all 25 members of the expedition were flown in to a small lake at the edge of the mountains and one-half mile south of the lateral moraine of the Klutlan Glacier. Three days later, we gathered on a bench near the base of the northwest ridge of Mount Wood, overlooking the area of about one square mile over which our main airdrop was scattered. As a demonstration of the advantage of numbers, in four hours of systematic searching, all the

boxes, bags, and cans (except one) had been located and collected at our base camp, altitude 6500 feet. Up to this point the sky had been clear and we were more worried about routes and the miles of loose moraine than the weather.

The decision was reached to split into three groups: one group of eight to attempt the unclimbed 9000-foot northwest ridge of Mount Wood, which rose directly above base camp; one group of five was to stay near base camp and attempt some of the smaller peaks near the head of Wood Glacier; the third group of 12 was to make the long hike up Brabazon Glacier and attempt Mount Craig and other peaks on the divide. However, two days later, the weather turned and thereafter became worse.

Within the two remaining days of good weather, the party which operated out of base camp was successful in ascending a few of the peaks, about 10,000 feet, near the Wood Glacier-Wolf Creek Glacier divide. The party of eight on Mount Wood reached about 13,500 feet before the storm forced a retreat. The decision to turn back was dictated by the growing avalanche danger. There were already 18 inches of new snow on the ridge, which in places is narrow and corniced, and the promise of the bank of black clouds rolling in from the sea was unmistakable. The good weather lasted just long enough for the Mount Craig group to reach the base of the peak. After building two igloos, they were able to sit out the storm in comparative comfort. But after six days, our time was nearly up and they, too, were obliged to return to base camp.

We left base camp two days later in 14 inches of snow. Four long days were required to walk out the lateral moraines of Wood Glacier, cross Klutlan Glacier, and finally reach our rubber life-rafts which had been air-dropped at the head of the Klutlan River, which bursts forth full-grown from under the glacial ice. Although this point is over 40 trailless miles from the Alaska Highway, in two short, but wet, days we had raced out to civilization on September 6.

LEIGH ORTENBURGER

Pioneer Ridge, Mount McKinley. In June 1956 six of us made an attempt on Pioneer Ridge on Mount McKinley. The party consisted of Keith Hart (leader) the Australian, Leon Blumer, Pete Schoening, Al Krup, Keith Randall, and Donald Claunch. We left the Bar Cabin on the McKinley River, two miles from Wonder Lake on June 1. After two days with 80-pound packs we reached McGonagall Pass and the following day hiked five miles up the Muldrow Glacier to the vicinity of Gunsight Pass, where we received an airdrop. We relayed loads up the two icefalls of the

glacier, where we were bothered by bad weather and crevasses and had to establish two intermediate camps. We finally pitched our advanced base camp at 10,000 feet on the fringe of the great basin below Karstens and Pioneer ridges. Snowshoes were mandatory between all these camps. (We used the long Alaskan type; our equipment also included down parkas and pants and Korean boots.) We traveled at night on the Muldrow Glacier because of excessive heat in the daytime, although higher on the mountain the temperature always dropped to zero or colder during the night. Once camp was established at 10,000 feet, we returned to Gunsight Pass to meet Schoening and Krup, who had been unable to leave until nearly two weeks after we did and had come this far alone.

On Pioneer Ridge we plowed through knee-deep snow, technically not difficult going, to place camps at 12,000 and 13,000 feet. The weather would occasionally clear up and we would find ourselves above a sea of clouds, with Wickersham Wall, one of the world's great ice faces, towering above and below us. Schoening, Krup, and I reconnoitered in extreme cold from 13,000 feet to Taylor Spur, a very distinct promontory at 15,000 feet. Some of the climbing was in chest-deep powder and some on steep ice and broken rock, touchy but not really difficult. I believe that Pete used one ice piton. After reaching the top of the spur, we returned to our 13,000-foot camp while the others packed heavy loads up the route we had opened. That night it snowed two or three feet, covering our hard-earned steps. It took an entire day to kick steps to rejoin the rest of the party on the spur. We attempted to cross the knife-edged ridge that leads to Wickersham Glacier and the last part of Pioneer Ridge, but the unexpected steepness of the last part forced us back. Our try to cross underneath the knife edge also failed. We had to camp on a nearby col which divided the ridge, where a three-day storm, with snow and 60-mile-per-hour winds, pinned us. We abandoned our attempt there because of the avalanche danger and the lack of food and time, after having completed most of the touchy climbing. From there on, it would merely have been a matter of traversing the Wickersham Glacier and climbing the upper portion of the wall adjacent to Pioneer Ridge with another camp at about 17,000 feet.

DONALD CLAUNCH

Traleika Glacier area, Mount McKinley Range. The Parachute Brigade Alaska Expedition, consisting of Captain W. M. M. Deacock, second-in-command and meteorologist, Captain J. D. Kinloch, doctor; Lieutenant Ord Pritchard, photographer, with Captain James E. Mills as leader and geologist was sponsored by the War Office and the Mount Everest Trust

and was supported by the Royal Geographical Society. Our aims were as follows: To explore the Traleika Glacier system and attempt some of the unclimbed peaks around it; to carry out a program of medical and physiological work under the advice of the British Medical Research Council; to make a geological collection for Bradford Washburn, of the Boston Museum of Science; to test army rations and service equipment; to make a record of meteorological observations; to make a film of the expedition.

At Ladd Air Force Base, Fairbanks, we were taken over by the USAF. On 26 May the 74th Air Rescue Squadron, which also supplied rescue cover and subsequent airdrops, flew the party in a C47 to the airstrip at Minchumina, 200 miles west of Fairbanks. From here the expedition with all its equipment was ferried by helicopter across the 60 miles of tundra to the meeting place of the Traleika and Muldrow Glaciers.

By man-hauling a sledge and back-packing, we gradually moved our camps up the badly crevassed Traleika Glacier with two or three relays between each. With 24-hour daylight, we worked at night when the snow conditions were best. The cunningly concealed crevasses ran in a tortuous pattern across the glacier; in consequence, each of us broke through into them with monotonous regularity and even the sledge suffered this indignity more than once. After eight days we reached a point opposite a glacier tributary which we called the Albuhera. From a col 3000 feet above us this glacier tumbled in an ice fall to join the Traleika. Our plan was to reach the col and attempt Mounts Tatum and Carpé. The col was gained on 8 June after two days' climbing, the party being delayed when Deacock fell 50 feet into a crevasse, from which he was successfully extricated. On 9 June after six hours of ridge climbing we made the first ascent of Mount Tatum, 11,137 feet. The return to our two-man tent on the col took 3½ hours, the last hour through a snowstorm. The proposed attempt on Carpé was frustrated by the snow which continued for another 36 hours. By lack of food we were forced to return to our camp on the Traleika.

We resumed our journey up the Traleika and pushed on up the left fork, our progress being hindered by continuing falls of snow. Since our arrival in the mountains we had been visited three times by USAF aircraft. We had radio contact, received mail, flares, and replacements for the two ice axes we had broken. The aircraft continued to come in about once a week whenever the weather was suitable and we received amazingly accurate maildrops and weather reports and exchanged news. From a camp at the head of the glacier we climbed with loads of over 70 lbs. each to a col 10,000 feet high on the rim of the mountains which enclose the Traleika. The climb of about 3000 feet took two days and in a blizzard on 21 June

we established our camp there, amid a jumble of ice cliffs and crevasses. We had hoped to cross the col, but the sheer drop on the other side made this impossible. Even our alternative of attempting the two peaks that stood on either side, and perhaps of gaining a large plateau which lay to the east, was all but frustrated by the weather. The snow fell almost continuously; despite this, on 23 June Kinloch and Pritchard climbed the peak on the west of the col and named it Mount Staghorn. The other peak we called Anniversary Peak and in the only two good days made two attempts on it. In the second attempt on 26 June we reached a point 200 feet from the summit before retreating in the face of dangerous snow conditions. We were out 15 hours. The descent to the glacier was in bad weather on 27 June, and after two days spent in collecting rock specimens, a journey up to the right fork of the Traleika brought us up under the rock ramparts of McKinley. The possibility of a new route up the mountain from the Traleika was confirmed. It is hoped that the first attempt up this route will be made by an Anglo-American party. Although the route looked difficult, a glacier tributary rising steeply to a col between mounts Koven and Carpé seemed to afford access to both mountains.

On our return to camp beneath the flat-topped peak which stands at the glacial fork, we made preparations to attempt it. Standing about 13,000 feet high and dominating the glacier, we had long since named it Pegasus Peak in honour of the emblem of British airborne forces. High winds prevented an immediate attempt, but we delayed withdrawal to make the climb. At 9:15 A.M. on 4 July we stood on the summit after an ascent of almost 6000 feet in just over ten hours' climbing. The descent was uneventful, but took us nearly eight hours.

We started the march out at midnight on 5 July. The lower glacier had changed out of all recognition in the past weeks and the enormous gaping crevasses forced us to abandon the sledge early. With 90-lb. loads we traveled for 28 hours with only three hours' sleep to reach Cache Creek in the early afternoon of the 7th. At 4:30 P.M. the helicopter landed and flew the first two out. By way of Kantishna and Minchumina we flew back to Ladd Air Force Base, arriving at 9 P.M. that same evening.

Journeys in these mountains demand not only normal climbing techniques, but also the methods and approach of an arctic expedition. The scale is vast and certainly appears more Himalayan than Alpine. All ascents start on ice and snow and the height difference from glacier to summit is immense, usually at least 5000 feet. There is little or none of the Himalayan problem of high altitude, but then there are no porters. The choice of route must be based on the capabilities of heavily laden climbers, but even so a

great deal of technically difficult climbing must be undertaken while carrying large and often awkward loads of considerable weight.

CAPTAIN JAMES E. MILLS, *Parachute Brigade, Mountaineering Club*

Attempt on the East Buttress of Mount McKinley. A four-man party (Walter Gonnason, Otto Trott, Paul Gerstmann, Bruce Gilbert) attempted the ascent of the east buttress of Mount McKinley during late July, 1956. Don Sheldon of Talkeetna landed them in his ski-wheeled Super Cub at 5500 feet on the southwest side of Ruth Amphitheater. They climbed a fork of Ruth Glacier to an altitude of 7700 feet right at the foot of the east buttress, where they received an additional airdrop. After establishing three camps above their airdrop site, they reached 11,400 feet on the crest of the ridge separating the Traleika and Ruth glaciers. They abandoned the attempt on July 27 after encountering conditions of extreme cornicing about their final (11,400-foot) camp. They returned to their 7700-foot cache and were flown out from this spot in relays by Don Sheldon after spending just two weeks on the mountain.

Canada

Waddington Region, Coast Range. In August, 1956, a group of six, consisting of Adolph and Ulf Bitterlich, of Vancouver Island, Philippe de la Salle, Sylvia Lash, Sarka Spinkova, and Earle Whipple, organized a trip to the Mount Waddington area of the Coast Range, British Columbia. Approaching from the head of Knight Inlet, the group ascended Franklin Glacier, set up base camp at Glacier Island, south of the Waddington massif, and recovered an airdrop near Glacier Island.

On August 9, four of the group made what was probably the first ascent of Mount Agur (10,200 feet), while Adolph and Philippe reconnoitered Buckler Glacier, which they found to be impassable. Thus, no approach to the north side of Waddington via Spearmen Col could be made. The party spent August 11-14 climbing the northwest peak of Mount Waddington (13,200 feet) from Glacier Island, via Fury Gap, all six members reaching the summit.

After this success, Adolph and Earle decided to attempt the south face of Waddington (13,260 feet). From a snow hole at the top of Dais Glacier, they ascended two-thirds of the face by a new variation, starting up the short (400-foot) couloir, and connecting with Wiessner's route near a big triangular snow patch, where lack of pitons, only enough for rappeling, forced retreat. In the author's opinion, the rappel route off the lower face is by far the safest, provided one can rappel 200 feet at one spot. Rockfall is

nil, even in daytime. Ascent by this route is difficult. The group withdrew by the same route by which it went in. All of us enjoyed the almost perfect weather, wonderful climbing, and magnificent scenery. (See: *Canadian Alpine Journal,* 1956, vol. 39, for further details.)

EARLE R. WHIPPLE

The Howson Range. In the angle formed by the Bulkley and Skeena rivers, in central British Columbia, there are a number of small compact ranges which rise to approximately the 9000-foot level. Since the deep valleys lie at about 2000 feet above the sea, their vertical relief is comparable to that of the mountains in the main chain of the Rockies. The Howson Range in Lat. 54° 25′ N. and Long. 127° 45′ W., with heavy glaciation for its altitude, is one of the most interesting of these.

I have now been on three short trips to this region where previous to 1954, none of the peaks had been climbed and the only exploration had been done by prospectors. There are a number of copper claims at the northern end of the range. In July 1954, Polly Prescott, Dave Wessel, Alex Fabergé, Rex Gibson, and Mrs. Gibson took 3½ days approaching the range via Telkwa River, using pack horses. Once established at our high camp, we were so dogged by bad weather and a late thaw that we only made one first ascent. We were, moreover, some eight miles north of the main peak. It was obvious that this was not the best approach, as it took too much time for trail travel in very rough country.

In 1955 a smaller party—Alex Fabergé, Dr. Iain Smart, Derek Boddy, Rex Gibson—flew in to Burnie Lake from Burns Lake in a chartered plane in mid-August. The weather, if anything, was worse than in 1954. We did, however, explore one large glacier and had a close-up view of the main Howson Peak, 9060 feet, from a high col about one mile away to the northeast. We worked out a practicable route to the south col, but we found Howson Peak plastered in new snow. The weather never really cleared until the day on which we were to leave, after which we suffered the frustration of wasting two perfect climbing days while waiting on the beach for the plane to come for us.

In 1956 we did a little better. Alex Fabergé and Rex Gibson were again in the party, and the other two members were Bob Schluter, of M. I. T., and Dr. John Strong, from Bulawayo, Southern Rhodesia, who was on his first trip to Canada. This time we flew in from Lake Else, which is 17 miles from Terrace and is west of the Howson Range. We landed at the same spot on Burnie Lake, July 31, and next day set up a high camp at just about the 4000-foot level beside a small glacial lake. On August 2 we

reconnoitered the west ridge, reached via the south col, but because we reached the west col only at 3:15 P.M., we returned to camp. A five-day spell of bad weather then intervened. On August 8, in clearing weather conditions, we made first ascents of some granite towers and reconnoitered the "Broad Glacier" leading over to the north col of Howson Peak. We made an attempt on the peak by the north ridge on August 9—a route selected from the air photos (verticals only, which gave little or no indication of the true vertical relief). This route definitely did not go. Bob and I, who went further than the others, reached a point at about 8500 feet on the north face, but were stopped by a number of towers which would have taken too long to circumvent. On August 10, a fine day, we made the first ascent of "Delta Peak" and again crossed previously unvisited glaciers. The plane came for us on time next day and we flew out in perfect weather. Howson Peak is still unclimbed!

E. Rex Gibson

Mount Fortitude, Selkirks. The first ascent of Mount Fortitude, a 9100-foot summit at the western border of Glacier Park, British Columbia, was made by Dr. and Mrs. Robert West August 21, 1956. This climb up the east ridge of Mount Fortitude was carried out from a camp at Flat Creek Pass, six miles south of Flat Creek Station on the Canadian Pacific Railway. From the pass, about 500 yards of alderslide were crossed to gain the grassy slopes of the east ridge of the mountain, which give way to shattered rock and finally to steep snow just below the summit. The climb presented no difficulties, and the summit was reached in five hours. Mount Fortitude provides a fine vantage point for views of the southern Selkirks and of the remote area south and east of the Albert Snowfield. Return to camp was by the same route, in three hours.

Robert West

Mount Edith, Canadian Rockies. Horst von Hennig made the second ascent of a route on the southeast face of Mount Edith in the summer of 1956 with the guide, Hans Gmoser. The latter describes the route as follows: "Our route was just on the east face proper, about 200 yards to the north of the big gulley that cuts through the southeast face. The first rope length leads up over a slab onto a small shelf. From there we followed a steep rib for another 150 feet and then traversed 30 feet to the right before following a small crack up for 40 feet. The rest was fairly easy scrambling and led us to the big shoulder on the south ridge. We followed the ridge from there to the summit." The first ascent was

by Franz Dopf, Philippe de la Salle, and Gmoser on May 10, 1953. Gmoser also describes a route through the east face: "On September 25, 1956, I made with Frank Garneau, of Montreal, a more direct route through the east face. It starts about 50 yards north of the other route. It follows a crack for about 250 feet before traversing for a long way slightly upward along a wide ledge. This leads directly to the bottom of a chimney system which intercepts the south ridge below the summit. This route is easier than the first, but more amusing."

Along the Backbone of the Big Bend, Canadian Rockies. With the support of three air supply-drops at an estimated distance of four days' hike apart, Sterling B. Hendricks, Donald Hubbard, and Alvi E. Peterson undertook to travel the alpine uplands from the mouth of Mica Creek, on the Big Bend Highway, B. C., to Flat Creek, on the Canadian Pacific Railroad. Beginning July 5 and proceeding directly up the wooded slope to Fred Laing Ridge, then continuing along the snowfields, rocky ridges, alplands, and flowering meadows, through Anemone Pass and over the east shoulder of Northeast Peak, the first supply-drop was located on the glacier directly on the route in mid-afternoon of the fourth day. After one day's rest near the upland source of Bigmouth Creek, the party proceeded along the wooded slopes and back country west of Trident Peak to a camp below the Escarpment névé. The following day was devoted to a reconnaissance trip across the névé and to the top of Escarpment Peak, about 10,000 feet, a first ascent. Neither the Escarpment Face nor the rocky arête of Escarpment Peak offered a wholesome route to the south. Along the acceptable route south over Rhea Pass and along Mist Glacier and in the view from Escarpment Peak, we saw how repulsive were approaches to Mount Neptune. On July 13, the party reached the second drop-area to the south of Mount Neptune, only to find that a broken ice cornice from the ridge above had started an avalanche that obliterated all traces of supplies. We considered surviving for ten days on the bulbs of yellow adder's tongues or fawn lilies as an emergency diet until we might traverse the unknown country and reach the third supply drop on the Belvedere névé near Mount Sir Sanford. Trident Creek was finally chosen as an escape hatch. After returning to the shadow of Mount Neptune, crossing Mist Glacier to Dolphin Pass, down and across Trident Glacier to Trident Creek Valley, which drops over a mile in less than three miles with extensive areas of devil's club and slide alders, the party arrived at the end of two days on the west shore of Kinbasket Lake, supplementing the last meal of rice with mushrooms and the last of the sugar with berries. The next day, July 16,

while hastily assembling a raft, the party was retrieved, fed, and returned to civilization by two pole-cutters.

DONALD HUBBARD

Ice River Region, Canadian Rockies. While doing geological field work in the region of Ice River, near Golden, British Columbia, in August 1956, I made the following solo ascents: (1) Zinc Mountain, via the ridge leading from the Manganese-Zinc col. This mountain was first climbed in 1906. A note on top recorded a 1954 ascent from Ice River valley by the northwest ridges, but I think that my route is probably a new one. It was moderate rock climbing all the way; (2) Manganese Mountain, from the col mentioned above. The ridge is of rather rotten rock. This is possibly a first ascent as I found no cairn on top; (3) Buttress Peak, about a mile southeast of Manganese, climbed by the east ridge, which rises from Moose Creek valley. A really pleasant climb over firm rock—airy, but quite safe, and grade 2 and 3 in difficulty. There was no cairn on top or any recorded ascent of this mountain.

THOMAS A. MUTCH

Coast Mountains of British Columbia, South of Bella Coola. If there is any doubt as to the accessibility of the area south of Bella Coola, the arrival of Houston's 1955 convertible removed such doubt. The road is dirt for some 300 miles. If one doesn't mind the never ending pounding that a low-slung car will take from high rocks on the road, any normal passenger-car can now cover the distance from Williams Lake to Bella Coola in 12 to 15 hours. Our group included Will Siri, Dave Rynin, George Whitmore, James Wilson, John Dorsey, and Dick Houston. We had an eye on unclimbed Snowside Mountain, 9600 feet, about 30 miles south of Bella Coola. We rolled into Bella Coola on a Monday morning ready for about three weeks of adventure. Luck was with us as we hitched a boat ride with a local pulpwood company up the South Bentinck arm to their outpost lumber camp. Behind this camp the brush started, as did the hard work. In six days of difficult back packing through indescribably thick brush we arrived within sight of Ape Lake, the site of the base camp of the only other party to penetrate this area.

Again, with Luck as our seventh member, we began what proved to be four days of perfect weather. Base Camp was placed at 6500 feet on the Wardrum Glacier to the SE of Snowside. The first day of climbing was spent on the SW face, and, after attempting the wrong mountain, we turned back as darkness approached. The following day proved

that the entire mountain was indeed rotten. The climbing teams continually ducked to avoid the bombardment as we attempted the great NE ridge of the peak. This route brought us to within 100 feet of the summit, where caution and darkness slowed the group. From high on a very steep knife edge of snow we retreated. We did not avoid a night out, however, for we were forced to wait at about 8000 feet for better light.

Two days later Wilson, Whitmore, Rynin, and Dorsey returned to the SW face and with the aid of several rock pitons overcame the steep and icy gullies and completed the first ascent.

The homeward trek of four days started at the head of Nusatsum River and moved down to Bella Coola River and the ever welcome cars.

RICHARD C. HOUSTON

Iceland

Hraundrangi, in Öxnadal. Two members of the Icelandic Air Ground Rescue Team, Finnur Eyjolfsson and Sigurdur Waage, accompanied by Lieut. Nicholas B. Clinch, USAF, accomplished the first ascent of Hraundrangi, August 5-6, 1956. The peak stands nearly vertical, 80 meters above the Hraun ridge, and has defied all ordinary means of climbing. The sagas relate that the hero Grettir Asmundarson had climbed it in ancient times and had left a knife and a belt on the top, "to belong to the one who could get it." The fact that nothing was found on the summit seems to prove either that someone had been there since Grettir, or that the hero had never been there at all—the latter appears to be the case, notwithstanding the saga. Enticed less by the legendary prizes than by the challenge of the peak itself, the three climbers flew from Reykyavík to Akureyri, where assistance was rendered by the local AGR as far as the base of the peak, on the Hraun ridge. From this base the climb was effected in nine hours, up and down, with the aid of pitons, nylon ropes, and other modern gear. *(From Icelandic newspaper clippings.)*

Colombia

Sierra Nevada de Santa Marta. Although the Englishman, Simons, produced the first useful maps of the Sierra Nevada in 1879 and 1881, British climbers did not set foot in the range until 1954. A. F. R. Wollaston, doctor to the first Everest expedition, and his wife, in 1923, failed to find a route into the high peaks from the hinterland of Santa Marta because of bad weather and thick forests. It was clear to us that we should climb in January, the only certainly dry month, and enter by a forest-free route. Before

our first trip in 1954, Colombian, German, United States, and Swiss visitors had made the first ascents of the biggest peaks. Without a complete list of the ascents or even of the expeditions, all one can safely say is that the biggest four or five peaks have all been climbed two or more times.

In 1954 I led a party of five on a reconnaissance to the region. My colleagues were Miss J. Kirsopp, Doctors J. Waterlow, H. Bunje, and P. Hugh-Jones. To save time on our approach march, we eschewed the customary route from the south side of the massif, which traverses numerous east-west ridges of considerable height, and were encouraged by the aerial survey map made by the Cabot Expedition (*Geographical Review,* 1941) to try a new route from the east, following a river that flows out that side. This route we now recommend most earnestly to intending visitors, as the Donacui River (marked erroneously on the otherwise excellent Cabot map as the Guatapuri) leads right to the heart of the highest peaks. In 1954, as well as in 1957, we flew from Jamaica via Barranquilla to Valledupar, whence we took a truck northward to Atanquez. This can be accomplished in a day. On the second day mules carried all equipment and stores to the Indian village of Sogrome, on the Donacui. On the third, Indian oxen brought the party to the foot of La Reina, possibly the most beautiful peak in the range (18,160 feet). In both years the oxen carried about a ton of supplies right up to Base Camp, at 14,600 feet, under the north glacier of El Guardián. The Indians are distinctly friendly, speak Spanish, and charge moderately.

The 1954 party got to its base camp so quickly that only there was it overcome by the discomforts of acclimitization. Hugh-Jones made a solo ascent of the prominent east peak of Simón Bolívar (18,947 feet), and I climbed El Guardián (17,175 feet) alone by the west ridge. These solo climbs, probably the only ones in the Sierra Nevada, were made only because the others of the party were unwell at the time. The party climbed Ojeda (18,012 feet) by the south glacier and west profile, and Miss Kirsopp and I climbed a rock peak east of Colón and named it Pico Juanita (*ca.* 16,800 feet). Snow conditions were uniformly good, though I met with literally hair-raising static electricity on El Guardián.

The objective of the 1957 expedition first made itself apparent from the summit of Ojeda. The Sierra Nevada falls into eastern and western groups, the highest peaks being in the latter. The high peaks had been most visited and no climbing east of La Reina had come to my attention. From the summit of Ojeda we clearly gazed upon the central of the three parallel ridges which form this eastern group. Ojeda itself is at the western end of the northernmost ridge, La Reina of the central ridge, and El

Guardián of the southernmost one. Seen from Ojeda, the ridge running east from La Reina is an astonishing sight, of which no hint is given by the Cabot map. It is immensely steep and caparisoned in ice from top to bottom because of its northern aspect. Aside from an ambitious program of high-altitude physiology, the 1957 expedition aimed to execute climbs on this central ridge, which we have since called the Sierra Tairona, and to map the Guatapuri basin, enclosed between the northern and central ridges. The party again included Bunje, Waterlow, and myself; its new members were Major R. Allen, of the British Army, and my brother, F. F. Cunningham, as cartographer. After spending Christmas in Jamaica, we were able, despite a leisurely journey, to be at Base Camp by the first day of 1957.

We began four weeks of climbing and theodolite-surveying with a second ascent of Ojeda. The doctors had an arduous programme, which involved measuring carefully each person's input of food as well as the analysis of regularly-collected blood and urine samples. Their chief concern was with the body balances of sodium and potassium. With the termination of surveying from the northern or Ojeda ridge, the party split, the doctors remaining at Base Camp while the survey team went back down to establish a new camp at 11,000 feet in the Donacui valley, which lies between the central and southern watersheds. From Tairona Camp, as it was called, the central ridge was partly visible, and from a col on the central ridge itself the whole of the northern range could be seen from Ojeda eastward to where the peaks drop away to reveal the Caribbean beyond. The four major peaks east of Ojeda were computed at 17,300, 17,509, 17,614, and 17,630 feet, respectively. Some peaks were climbed on the Tairona ridge, for survey purposes or pleasure, and the Colombian authorities have been asked to name two of these as Pico Santa Bárbara and Pico de los Hermanos. The latter is 17,377 feet; other Tairona summits were measured at 17,241 and 17,306 feet. It will be noticed that all these tops are higher than El Guardián, formerly thought to be among the highest half-dozen in the entire range.

A. E. CUNNINGHAM, *University of London*

Argentina

Cerro Gallan, Province of Salta. Although our Austro-Swedish Andean Expedition did some excavations in the ruins of the Indian town of Guanchin and of the fortress of Batungasta near Fiambalá, it was not there, near the Ojos del Salado, but 225 miles north, in the province of Salta, that we planned to do our chief archaeological work. Some years before, the Salzburg climber, Dr. Dangl, had discovered some walls built at

about 19,000 feet on the summit of the striking volcano, Cerro Gallan, which rises above the high desert. The second objective of our expedition [The first was to climb the Ojos del Salado.—Ed.] was to investigate this extraordinary trench-like construction at that high altitude. Starting from our base at 15,500 feet, we established a high camp at 17,500 feet. At 19,000 feet I managed to dig out and investigate systematically the three rubble-covered rectangular walls. I worked together with my Swedish companion, Anders Bolinder, on the first day, and alone on the next two, after he fell sick. It took all my energy and I was often close to exhaustion. Among other things I dug up three ancient Indian statuettes made of silver and a material composed of reddish shells and clothed in brilliantly colored cloth. There were also charred pieces of wood, a tiny woolen rag, charred bones, as well as three stone clubs, all of which indicate that it must have been a primitive site for making offerings in Incan times. I nearly lost my life when a tunnel collapsed just after I emerged. Experts have confirmed our beliefs that these objects did originate in the era of the Incas.

MATTHIAS REBITSCH

Province of Salta. P. Soana, H. Azuremendi, and J. Miranda climbed the 19,948-foot volcano, Socompa, February 24, 1956. M. Fernández and P. Balderrama climbed 19,882-foot Chañi.

San Lorenzo, Patagonia. This peak, 11,647 feet, probably the second highest in Patagonia, which lies on the Chilean-Argentine frontier, was first ascended by the Padre de Agostini, in 1941, with A. Hemmi and H. Schmoll. On January 19, 1956 the Argentines Jochen Groos, Hugo Corbella, and Guillermo Krings, of the Centro Andino Buenos Aires, made the second ascent of this heavily-glaciated peak.

Cordón de la Jaula. Under the leadership of Jorge Peterek, a group of the Centro Andino Buenos Aires made a number of first ascents in this range, which lies southeast of Aconcagua and about 40 miles south of Upsallata. The others were Pablo and Andrés Dudzinski, Estanislao Blicharski, and Andrés Patewski. From a 10,000-foot base camp up a side valley off the Río Blanco they set up a high camp at 13,500 feet. From there, on January 8, 1956, they climbed up steep ice to a col between Giewont, 16,400 feet, and Tatra, 17,050 feet, and thence to both summits. From camp in another valley a little farther north, on January 13, they climbed 17,150-foot Karpinski and continued along the ridge to CABA, 17,325 feet, and Aguila Blanca, 17,725 feet.

Cordón de Portillo. Climbers from the club Andinista Mendoza made a number of first ascents in this range, which also lies southeast of Acon-

cagua. These were Gemelo Norte, 17,700 feet, January 13, 1956, and Torre del Campanario, 17,050 feet, January 16, by R. Vidone, R. Gallop, S. Chiartano; Krakus, 16,575 feet, January 14, by M. Czareba; Yeporá, 16,575 feet, January 15, by J. Casanova, F. Bellinaud, U. Vitale.

Near Bariloche. Already this spring [Written December 27, 1956, at the beginning of the southern hemisphere summer.—Ed.] there have been the following notable ascents made near Bariloche: (1) first ascent of Aguja Frey, another problem involving artificial aids, by W. Lerch, November 4: (2) first ascent of the north face of Punta Lürs, on Cerro López, a risky and airy climb on rotten rock with illusionary protection, by D. Jereb and H. Lantschner, December 9; (3) first ascent of the north face of the Cerro López, a route studied for several years which turned out to be easier than we had thought, by I. Arnvek and V. Arko on December 23; (4) third ascent of Campanile Esloveno, a 300-foot rock tower considered to be the most difficult climb yet made in Nahuel Huapí Park, by C. Sonntag, J. Iglesias, C. Bottazzi, December 15.

VOJSLAV ARKO, *Club Andino Bariloche*

Volcán Lanín. The only long new route made so far this season was on the south face of Volcán Lanín, 12,388 feet. The upper part of this peak has a cap of ice that guards its upper slopes. On November 17, 1956, Carlos Sonntag, Gregorio Ezguerra, Wenceslao Clerch, Juan Mager, Augusto Vallmitjana, Ivan Arnvek, and Carlos Bottazzi left camp at about 3500 feet. They climbed the rocky ridge that leads to the bottom of the cap of ice. At 7000 feet they saw close at hand the enormous overhangs that mark the whole of the lower edge of the icecap. The only route, difficult to be sure, but not exposed to falling ice, is the small glacier which Mazzoldi and Wiese climbed. [See *AAJ,* 1956, pp. 133-134.] All other possible variants lead to slopes swept by falling séracs. The hanging glacier seemed uninviting and was swept continually by rocks and ice. However, the group crossed towards the east ridge, where it bivouacked. On November 18 the climbers overcame a difficult passage that leads from the ridge to the glacier. Climbing the steep and relatively easy slope of the glacier, they reached the summit at 2 P.M. They descended by the same route.

VOJSLAV ARKO, *Club Andino Bariloche*

Chile

Monte Sarmiento, Tierra del Fuego. An Italian expedition under leadership of 74-year-old Padre Alberto M. de Agostini climbed Monte Sarmiento, the highest point in Tierra del Fuego and the goal of Sir Martin

Conway, in 1898, and of Padre de Agostini himself, in 1915. This peak, 7887 feet high, according to some reports, and 7120 in others, rises sharply from the sea and because of the nearly constant bad weather is heavily glaciated. After failing on the north of this very difficult mountain, Carlo Mauri and Clemente Maffei climbed the southwest face, from a Camp II, March 7, 1956. Later, Luigi Carrel, Camillo Pellissier, and Luigi Barmasse climbed Monte Italia, which they give as 7210 feet, and Monte Francese, 7054 feet, in the Cordillera Darwin.

Peru

Vilcanota and Cordillera de Caravaya. In July 1955 the Italians, 72-year-old Piero Ghiglione and Francesco Zaltron, ascended Vilcanota, 18,521 feet, by the southeast face. [All altitudes are those given by Ghiglione. It is the opinion of members of the American Andes Expedition 1956, who made a reconnaissance flight over the area, that most of them are considerably too high.—Ed.] A previous German ascent had been made from the north. Joined by the Swiss, Felix Marx, they continued first east, then north, to the end of the road at Chabuca, at the southern foot of the Cordillera de Caravaya. Their first climb there was San Vicente, about 18,375 feet, which they made on July 16. They moved northward climbing on the same day two peaks which they named Almerico da Schio, 18,242 feet, and Alessandro Rossi, 18,701 feet; then, on July 19, San Braule, 17,553 feet. On July 21 they reached the south peak of Gran Chimboja, 18,865 feet, but cornices and bad snow conditions prevented their getting to the main peak that rose some 350 feet higher. On July 25 they climbed Yanoloma, 20,050 feet, finding difficult steep ice near the summit. To the north of this peak they climbed a 19,128-foot peak which they called Thiene. This ascent, on July 28, was more difficult because of new snow.

British Expedition to Pumasillo and Huagaruncho. Before heading for their main objective farther north, four members of the British party, George Band, Dr. Donald S. Matthews, Jack Tucker, and John Streetly, made, in June 1956, a reconnaissance in the Pumasillo (Puma's Claw) area of the Cordillera de Vilcabamba. It appears that the mountain is incorrectly located on existing maps and given too high an altitude, 20,492 feet. Advancing from the head of the narrow-gauge railroad at Huadquiña, they headed for where they thought they might find the peak. On the summit of a 17,500-foot mountain they saw big peaks to the east but were separated from them by deep gorges. They withdrew. The expedition leader, John W. R. Kempe, and Michael Westmacott

joined them. During July several of them climbed in the Cordillera Blanca above the Quebrada Parón. They explored the slopes of Pirámide, or Pirámide Garcilaso, and Artesonraju, but continual bad weather prevented their reaching any summits.

The climbers now turned their attention to their main objective, Huagaruncho, 18,797 feet. [As with many Andean peaks, various altitudes are given for this mountain. 19,292 feet is also found.—Ed.] From Huachón they established their reconnaissance base on the shores of Lago Talenga. Thence they moved across a 15,000-foot pass to the area north of Huagaruncho. In a two-day reconnaissance they found the way to bypass an icefall by climbing a rock buttress, and reached the glacier on the northwestern side of the mountain. Camp I was placed, August 6, at 15,600 feet, on the hanging glacier beneath the western col. Above the col a precipitous step forced them to traverse 100 feet onto the steep south face. It took them seven days to build a route with fixed ropes to regain the ridge, only 300 feet above where they had left it. Westmacott and Streetly reconnoitered the ridge to the next to the last bulge on August 14. Next day Kempe, Band, and Tucker, after climbing an ice wall, were turned back only 300 feet from the summit by soft snow and a snowstorm. On August 17 Westmacott and Streetly reached the others' high point by 9 A.M., after only a 3½-hour climb along the now well-engineered route. The next hundred feet were in waist deep powder-snow. Then, an ice wall forced them left of the ridge onto the north face, up which they cut for 150 feet before regaining the summit ridge. They stood on top at 11:30. Band, Streety, and Westmacott climbed the west peak, or Peak A, about 18,000 feet, August 19. Unfortunately Dr. Matthews died, September 3, of a heart attack after his return to Lima.

Verónica, Soray, Salcantay. In May and June 1956 the French guide, Lionel Terray, the Dutch geologists, C. G. Egeler and Tom de Booy, and the Swiss, Raymond Jenny, made three remarkable ascents west of Cusco. From camp at 15,400 feet on the northern slopes of Verónica, 18,832 feet, they reconnoitered for several days before finding a snow couloir that gave them access to the northeast ridge. Using fixed ropes, on May 13 they climbed about 1000 feet to camp on a small snow-platform just below the ridge top. The Peruvian porter, Eliseo Vargas, who accompanied them on the whole of this climb, carried about ninety pounds on this very difficult ascent. The following day was spent reconnoitering and fixing ropes. On May 15 they all left on the 9½-hour climb to the summit. There were great technical difficulties, including a 200-foot rappel during the ascent.

Their camp on Soray, 18,964 feet, was established June 2 at 16,000 feet, on the glacier at the foot of the northern face of the mountain. The climb was made next day in doubtful weather with poor visibility. They had to climb two 60° ice-walls and cross two large and dangerous couloirs to reach the ridge east of the summit. This they followed for 1000 feet before they were blocked by a final ice cliff. Traversing out onto the south face, which dropped for 5000 feet below them, they climbed the last 300 feet to reach the summit at 5:30 P.M. The difficult descent took them until midnight. That night an avalanche swept down to within 50 yards of their camp. Next morning, while descending a couloir below this camp, they were nearly caught by another avalanche.

The party climbed Salcantay, 20,000 feet, by a new route which led diagonally across the north face. Leaving Camp I, at the base of the northeast ridge at 16,750 feet, in doubtful weather, June 10, the climbers traversed a steep slope, climbed an ice wall, a couloir, and another ice wall, where by exception they cut steps. (Ordinarily they climbed slopes up to 60° on crampons, using the ice axe for support only.) The ascent of a rock- and ice-ridge completed the climbing for that day. They cut a platform in the ice for Terray's special tent that had a perpendicular back wall. Wall and floor fit exactly into the right angle of the niche, while the sloping part of the roof has the same pitch as the slope and is designed to let avalanches pass over it. There, at 19,000 feet, Egeler had an attack of kidney stones and had to remain the next day while the other three traversed 650 feet and climbed a very steep face to the saddle between the two peaks. They reached the summit June 11, at 9:15, after a 3½-hour ascent from their high camp. The descent to Camp I was finished after dark, Terray losing his ice axe.

Chacraraju and Taulliraju, Cordillera Blanca. The Frenchmen, Lionel Terray, Maurice Davaille, Claude Gaudin, Dr. Pierre Souriac, Robert Sennelier, and Maurice Martin, and the Swiss, Raymond Jenny, left Jungay, ascended the Quebrada de Llangunuco and crossed to the Quebrada de Huaripampa, where they set up their Base Camp. They established Camp I July 19 on the northeast glacier of Chacraraju, 20,000 feet, at 16,750 feet. Camp II was placed at 18,000 feet on the rock- and ice-face July 24. The next day was spent fixing ropes on the next 650 feet, up to the col between the eastern and the (higher) western summits. Bad weather forced them down again until July 30. On July 31 the climbers set out at 5 A.M. for the summit. Thanks to the fixed ropes they reached the col at 7:30 A.M., but progress up the heavily-corniced ridge was slow, and by 1 P.M. they had reached only a shoulder,

below the summit, which was surmounted by a rock wall that proved to be the most difficult part of the climb. They reached the summit at 5 P.M. Darkness overtook them on the descent and they did not reach Camp II until 7 A.M. next morning.

The climbers traversed up the Quebrada de Huaripampa and crossed a pass to the north face of Taulliraju, 19,128 feet, where they set up Base Camp August 12. Camp I was pitched three days later, above difficult slopes at 17,400 feet. After bad weather all the climbers except Martin and Jenny climbed all day August 17, but were obliged to bivouac at the base of a 120-foot cliff. Next day the climb continued until they reached the summit at 2:30 P.M.

Peruvian Ascents. The following list of ascents in 1956 by Peruvians, as well as other important data, were provided by César Morales Arnao, of the Grupo Cordillera Blanca de Huaraz. Whether these are first ascents or not, is not clear. From the San Antonio de Esquilache mine, west of Puno, Gustavo Alencastre Montúfar climbed Sayhua, 18,996 feet, Caballuni, 18,964 feet, and Ankasillo, 18,340 feet. With Jorge Pakusich and Percy Cáceres, Alencastre climbed the west ridge of Huagochullo, 18,209 feet, in the same region. Alfredo del Arroyo and Elsa Garrido Klinge climbed the west peak of the Nevado Anticona, 17,389 feet, July 39, and, on August 4, César Morales Arnao and José Tord Nicolini climbed the central peak, 17,161 feet, of the same mountain, from Ticlio by the south glacier.

Cordillera de Vilcanota. A British expedition consisting of John Jewell, Pat O'Donaghue, Ralph Whitling, and Colin Darbyshire left Sicuari May 19, 1956 to establish Base Camp three and a half days later, at 16,000 feet, just south of the Chimboya Pass. They explored the region, including the Imata valley and the west side of the Quenamari ice plateau. They climbed Allcachaya, 18,955 feet, and Imata, 18,400 feet, and several other 18,000-foot peaks in the Imata, Pichiya, and Queccarani groups. They also did some mapping. On July 4 they began their return journey, which took them across the Chimboya Pass to Chabuca and thence to Santa Rosa.

Nepal

Dhaulagiri. The Argentines made a second attempt on Dhaulagiri, (26,795 feet.) Under the leadership of Lt. Col. Emiliano Huerta were Mario Bertone, Sergeant Felipe Godoy (who was on the first expedition), Sergeant Humberto Vassalla, Vicente Cichitti, Benjamin Soria, Orlando Bravo, and Jaime Femenías. On April 6, 1956, the first four

were at Base Camp at the foot of the mountain, at 14,750 feet. This had been Camp I on the previous Argentine Expedition. On the same day the second four were still only at Pokhara. By following the Mayandi Khola, three of the latter joined the expedition only on April 29, after the first group had already established Camp I at 16,400 feet and an intermediate camp at 18,000 feet. I, on the other hand, arrived at base camp April 20 ahead of the rest to inform the party of our whereabouts. On April 25, with our sirdar, Ayiwa [Probably Ajeeba, H. C. No. 10—Ed.] I climbed Manapati in the Dhaulagiri Himal.

The first attempt on the summit was made, starting May 8, by the leader Huerta, with Godoy, Vassalla, and the Sherpas Karma (also of the previous Argentine Expedition) and Pasang. They began from Camp II, at 20,000 feet, and climbed the "Pear," to establish their Camp V at 25,000 feet at the same spot that Ibáñez's expedition had had its Camp VII. Supplies and equipment had been badly organized and ran out at that point, halting their ascent.

The second attempt was organized in Camp II, and the following participated: Godoy, Vassalla, Cichitti, Ayiwa (who had been with Herzog on Annapurna and was for the third time on Dhaulagiri), Karma, Pasang, and I. We started May 22 and reached Camp V May 26. Again, supplies ran out, and we had to return, evacuating the mountain May 29. We crossed French Col to Tukucha and returned thence to Pokhara. Typical of our unfortunate organization was the fact that we had oxygen equipment, but no oxygen in our cylinders. We also tragically lost one porter, Bal Bahadur, who died in an avalanche at 17,400 feet, just below the intermediate camp.

JAIME FEMENIAS, *Asociación Tucamana de Andinismo*

Manaslu. In 1956 the Japanese made a fourth and successful expedition to 26,658-foot Manaslu, the world's ninth highest peak. Having briefly scouted out a route in 1952, they returned in 1953 to climb to within 1250 feet of the summit. In 1954, they were prevented from attacking the mountain by the villagers of Sama. The 1956 twelve-man expedition, under the leadership of Yuko Maki, left Katmandu March 11. It took them three weeks to reach Sama, at the foot of the mountain. They advanced up the Manaslu glacier, where Camp I was established April 7 at 17,000 feet. Camp II, on Naike Col at 18,400 feet, was advanced base camp. Between Camp II and Camp III, at 20,300 feet, lay an icefall. Camp IV was at 21,300 feet, and Camp V at 24,000. On May 8 Toshio Imanishi and Gyalzen were established in Camp VI, at 25,500 feet, with the help of Junjiro Muraki and four Sherpas. They reached the summit May 9 at 12:30. Two

days later Kiichiro Kato and Minoru Higeta also climbed to the highest point.

Khatung Kang. A small Swiss expedition consisting only of Engineer Dériaz, his wife Marguerite, and Arthur Baumgartner, left Katmandu March 28 and traveled to Thorungtse Pass above Muktinath. Mme. Dériaz and Baumgartner reached the 20,670-foot peak from Camp II.

India

Ratang-Parbati Expedition, Spiti. We explored and photo-surveyed a hitherto unmapped area of over 400 square miles, crossing ten virgin passes varying in height from 17,800 to 21,000 feet, one across the Main Himalayan Divide itself. Fifteen new glaciers were discovered, and a peak of 22,500 to 23,000 feet was seen for the first time in an area where the highest peak for 50 miles was thought to be only 21,760 feet. We climbed altogether ten virgin peaks, six over 21,000 feet. Nearly 300 pounds of ammonite fossils were collected from the Spiti shales for Dr. W. S. Arkell of the Sedgwick Museum, Cambridge.

The expedition, Garry W. Walker, Pran Nath (an Indian Security officer), and Peter F. Holmes, left Manali June 12, crossed the Rohtang La, and established a temporary base camp at Shigri, 13,000 feet, June 17. We also had the services of Rikzen, a Ladakhi porter and first-rate mountaineer. A party of four then pushed up into the Karcha Basin, which had never been done before. In spite of very poor weather, we discovered and crossed five new passes in the next three days.

On June 20, Rikzen and Holmes made the first ascent of a 19,300-foot peak in terrible weather. A second peak, 18,900 feet, was climbed the next day by the same party. An attempt on "The Lion," 20,000 feet, was frustrated by continuing storms and deep snow. The party returned to Shigri on the 22nd. The whole Expedition then walked over Kunzum La, *ca.* 15,000 feet, and down the Spiti Valley. The next fortnight was spent collecting ammonites, making friends with the local people of Spiti, visiting a Tibetan Buddhist monastery, and meeting The Nono, the temporal ruler of Spiti.

The Ratang Gorge, first penetrated in 1955 by a party led by Holmes, was forced in three days with the help of 22 coolies, and on July 9 a permanent base camp was established at 14,500 feet. On the 10th an advanced base camp was established at 16,000 feet, and on succeeding days camps I, II, and III were established at 18,000 feet, 19,500 feet, and 21,000 feet, respectively. On July 14 two peaks near Camp III, of 21,050 feet and 21,100 feet, were climbed for the first time by a party of six. On

July 15 a virgin peak of 21,400 feet was climbed by Walker, Pran Nath, Rikzen, and Holmes. The weather continued bad, so an attempt on the nearby 21,760-foot peak was abandoned. On July 19 Rikzen and I climbed virgin peaks of 21,200 feet and 21,410 feet from a new camp at 20,000 feet. On the same day we became the first mountaineers ever to penetrate into the Gyundi Valley. Because of heavy snow and Rikzen's damaged hand, a retreat was then made to Base Camp. On July 21 Walker and I, from Base Camp at 14,500 feet, climbed a new peak of 19,500 feet. We also crossed two important new passes of over 19,000 feet. On July 25 Rikzen and Holmes climbed a peak of 19,700 feet from a camp at 16,000 feet. The following day the same pair climbed the highest and by far the hardest peak successfully attempted. Starting from a camp at 18,500 feet, continuous difficulties and extreme exposure were encountered for nearly 3000 feet. The summit was 21,500 feet. Happily, the weather was perfect for almost the first time on the expedition and a view was obtained right into Tibet, Bashahr, Kulu, Lahul, and Ladakh—perhaps 70 miles in every direction.

Abandoning all but the most essential equipment and food, the expedition then began the return over the Main Himalayan Divide. The first pass was crossed with difficulty July 30. The second was reached August 4, but because of unexpected difficulties (bad weather, a 3000-foot precipice to negotiate with heavy loads), the crossing and descent took much longer than had been anticipated. For two days the fate of the whole expedition hung in balance; we were now without food and the weather had become impossible. The situation was saved by the appearance of a wild goat who was forthwith despatched. On August 14 we returned to Manali, exhausted and happy.

PETER F. HOLMES, *Alpine Club*

Deo Tibba, Lahul. In June 1955 the German, Rudolf Rott, made the second ascent of the lower (19,687 feet) of Deo Tibba's two summits. He also climbed Malana Peak. In August and September 1956 the Frenchman André Guillemot and Sherpa Nima Tensing were in the same region. They climbed three 21,000- to 22,000-foot peaks in the Lahul Range from a 19,000-foot camp near the Kulti valley beyond the Rohtang Pass. After recrossing the pass, they climbed a fine rock tower in the Deo Tibba group.

Baspa Valley. J. M. T. Gibson again took a group of schoolboys into the central Himalaya in May and June 1956. They explored the Shaone Gad, a tributary of the Baspa, that flows into it just above Raksham. They made the first ascent of a 17,600-foot peak east of the Shaone Gad.

Shigri Glacier, Lahul. The all-woman Abinger expedition, under the leadership of Mrs. Joyce Dunsheath, and composed also of the Misses Delaney, Gregory, and Reid, spent the second half of May and June 1956 at the head of the Chandra valley on Shigri Glacier, above which they climbed six peaks between 19,000 and 20,000 feet.

Fifth Ascent of Trisul, Garhwal, and ascents in Lahul. The Bavarian brothers, Adolf and Fritz Hieber, and the Bombay lawyer, Keki Bunshah, with Sherpa Gyalzen Minchung (H. C. No. 163) and his brother Wangdi, were active in the mountains just south of the Rishi Nala in June 1956. After two unsuccessful attempts, Bunshah and Gyalzen reached the top of Trisul, 23,360 feet, on June 12. Five days later the Hiebers and both Sherpas repeated the ascent. With the Englishman John Albiston, they attempted 22,490-foot Mrigthuni on the southern rim of the Nanda Devi basin. Bunshah and the Hiebers attempted Bethartholi's northeast ridge, Fritz Hieber and Gyalzen reaching the south peak, 20,729 feet, of this 20,840-foot mountain. Bad weather drove the party off Devistan, 21,500 feet, after they had reached about 19,500 feet on the west face.

In the same region Gurdial Singh's expedition to Mrigthuni was brought to a tragic end when N. Chuckerbutty died from illness July 14.

After the beginning of the monsoon, the Hiebers and Albiston visited Lahul, where they climbed what they describe as the main peak of the Kulti valley, 19,791 feet, and six mountains over 16,400 feet.

Saser Kangri. Saser Kangri, 25,170 feet, lies on the eastern end of the Karakoram, north of Leh. This was unsuccessfully attempted by an expedition early in the summer of 1956. The group from the Himalayan Mountaineering Institute was under the leadership of Major Narendra J. Jayal. The west face of the mountain appeared too dangerous and the approaches to the eastern side were impossible, apparently because of high water or glaciers and difficult high passes.

Pakistan

First ascent of the Mustagh Tower, Northwest Arête. Under the leadership of John M. Hartog, the British Baltoro Expedition 1956 made the first ascent of Mustagh Tower, 23,860 feet. The other members of the party were Ian G. McNaught-Davis, Joe Brown, Dr. T. W. Patey. Liaison officer was Captain Riaz Mohammad, of the Pakistan Engineers. Four Hunza porters were recruited for high altitude work and were flown over from Gilgit, but were dismissed at Urdokas, 13,310 feet, as they were unwilling to work. The best four of the Baltis were promoted to high altitude porters and did splendidly.

Base Camp was installed at 14,050 feet, May 28, on Mustagh Glacier a mile and a half from its junction with Baltoro Glacier. Camps I, 15,850 feet, and II, 17,500 feet, were established in the first half of June on Chagarau Glacier, whose lower séracs were avoided by climbing the moraine to the north. Where this petered out into steep rock slabs, swept with avalanches and stonefall, a route was found among séracs and up the icefall, here less steep. Between camps I and II the glacier is much crevassed. Camp III was at 20,850 feet, on the actual west col of Mustagh Tower, at the top of a very steep ice wall, 1,900 feet high, sometimes swept by stonefall. This ice wall south of the col was the first major difficulty; it was ascended as directly as possible to the rocky cliff below the col, up which an 80-foot open chimney led directly to the camp. The top thousand feet of this section of the route was equipped with fixed rope so that porters and laden climbers could ascend and descend in maximum security, even in poor weather. The col was first reached June 16, but only occupied from June 30, when three tents, fuel, and food for 65 man-days, and other gear had arrived. Water was available here in a pool under some ice. Camp IV was placed at 21,125 feet on the crest of the west ridge. The great rise between Camps III and IV is the hardest part of the route, comparable, had it been 10,000 feet lower, with the great climbs on the Brenva face of Mont Blanc. The south face of the mountain is overhanging rock; the north face consists of snow, ice, and hanging glaciers. The boundary of these two faces offered a route which though very exposed and "mixed," was finally climbed on the third day it was attempted. It took time to clear the iced rocks and fix the ropes with which the route was equipped. Without this safeguard, it would have been unjustifiable. Just below the top of this section there is a 100-foot high cliff running right across the ridge. Brown turned this, traversing out on the south face, around a sensational corner. Above Camp III, the party formed two ropes of two. This pure rock-climbing on the final cliff was done "free," but to avoid it on the descent, a fixed rope (single strand nylon line) was thrown down the cliff for an abseil. Over 1000 feet of fixed rope were placed in this section, all in one length tied together and fastened to pegs at 50-foot intervals.

Above Camp IV, the route lay on the north face, avoiding overhanging rocks of the south face (which stretch for some distance across the arête) by a couloir, three feet of powder snow lying non-adherently on ice. After 200 feet of this dangerous treadmill, the way lay up more open snow and ice to the here stabler rocks of the south face (equivalent to alpine grade

III) for three ropes' lengths. The final major difficulty to be ascended is a leaf of rock between the summits, only ten feet high, but alpine grade V. Here the exposure was 8000 feet to the north and 6000 feet to the south. Another 150 horizontal feet of a very acute-angled snow arête led to the top. A piton was inserted at the top of the rock leaf to act as a belay, and to fix an abseil on the descent. Both ropes had to bivouac on the way down, above Camp IV. John Hartog's toes were frostbitten. The summits (West, 23,850, and East, 23,860 feet) were reached on the 6th and 7th of July, each rope supporting the other. All the climbing members of the party got up. The four high altitude porters and the liaison officer did not go above Camp III. Weather followed the alpine pattern. Fifty percent of the days were bad. Three rock pinnacles, between 19,000 and 20,000 feet, behind Base Camp were ascended by some of the members of our party.

JOHN M. HARTOG, *Alpine Club*

Second ascent of the Mustagh Tower, Eastern Arête. While the British were attacking the Mustagh Tower from one side, a strong French party under Guido Magnone was on another, consisting of André Contamine, Paul Keller, Robert Paragot, and Dr. Francois Florence, with Captain Ali Usman as Pakistani liaison officer. The French ascended the Younghusband Glacier which descends from the north into the Baltoro. Base Camp was established at 14,750 feet June 12. After reconnoitering the western fork of the glacier to a col at 18,400 feet, they saw that the north ridge was utterly impossible. They attacked the eastern branch of the glacier, which was difficult but possible. Camp I was at 16,750 feet, above a ropeway that was installed on the rocks to bypass a steep icefall. Camp II was higher on the glacier, at 17,700 feet. Here the attack on the mountain itself lay up a rock- and ice-spur to Camp III at 19,700 feet. Four hundred meters of fixed ropes were used in this section. Camp IV was at 20,675 feet, at the base of the summit pyramid. It took the climbers two days to work out a route from their high camp up the 800 feet to the summit ridge. It was then, just before a two-day snowstorm, that they had the disheartening sight of the British climbers on the summit. Fixed ropes allowed them to regain the summit ridge July 11 in only 3¾ hours, but difficulties were so great, especially on two great rock towers, that by 4 P.M., they had only reached the base of the final tower. There, at about 23,000 feet, they bivouacked. They felt that the last part of the climb was less difficult, but deep snow, which was in danger of avalanching, made it arduous. They reached the summit at 1 P.M. July 12, and finished their descent to Camp IV in the dark.

Gasherbrum II. On July 7, 1956 a strong Austrian party reached the top of Gasherbrum II, 26,360 feet, the world's thirteenth highest peak and the third 8000er to be ascended by a citizen of that country. The climbers were plagued by porter troubles on the march-in from Skardu. The final straw came on Baltoro Glacier, just two days' march from Base Camp, in the form of a snowstorm. All but the eleven high-altitude porters quit there, and the latter and the Austrians were left alone to establish Base Camp at 17,425 feet, May 23, on South Gasherbrum Glacier. [The accuracy of this name is questioned, since Gasherbrum Glacier lies north of the group and we understand that the Austrians approached the peak from the Baltoro and therefore from the south.—Ed.] A ten-day snowstorm pinned them at Camp I, at 19,700 feet. During this period a huge avalanche carried away a nearby supply-dump and buried forever much of the high altitude equipment, including seven of the lightweight tents. A consequent change in plans reduced the number of high camps from five to three and established a much shorter time schedule. Camps II and III were carried to 22,000 and 23,300 feet, respectively. On July 7 the leader, Fritz Moravec, with Josef Larch and Hans Willenpart, left Camp III and started up the ice slopes above, which they felt were too steep for porters. They spent a planned but frigid bivouac about 1500 feet from the summit. Although they slept but little, and although Moravec and Larch received slight frostbite, they climbed to the summit in about seven hours July 7.

On July 19 Hans Ratay, Heinrich Roiss, and Dr. Georg Weiler climbed from Camp II an unnamed 25,350-foot mountain between Hidden Peak and Sia Kangri, above East Baltoro Glacier. The two other members of the party were Richard Reinagl and geologist, Dr. Traugott Erich Gattinger. Dr. G. O. Dyhrenfurth announces in *Die Alpen* that he is sure that this peak is the western summit of Sia Kangri (*ca.* 24,000 feet). This mountain was first climbed by Dr. and Frau Dyhrenfurth, Hans Ertl, and Albert Höcht, April 3, 1934. The main peak of Sia Kangri is 24,350 feet, an even 1000 feet lower than the height given by the Austrians.

Lupke Lawo Brakk, Biafo-Hispar glacier area. The London School of Economics Mountaineering Himalayan Expedition carried out its main objectives of traversing the Biafo-Hispar glacier system in the Karakoram Himalaya and of climbing peaks near Snow Lake at the junction of these two glaciers, despite persistent bad weather and the protracted illness of one member of the party. We left Skardu July 13, 1956 with forty porters. After a two weeks' march of a hundred miles we established Base Camp, at 15,700 feet, at the junction of the Snow Lake and

the Sim Gang glaciers. The journey was arduous, due to extreme heat, frequent difficulties with porters, and detours necessitated by the state of the rivers. Unfortunately, the weather, fine during the approach march, deteriorated a few days after our arrival and from then on we were continually hampered by heavy snowfalls.

Our attempt to climb Lupke Lawo Brakk, 21,650 feet, highest of the peaks around Snow Lake, absorbed all our energies for the next four weeks. Extensive reconnaissance of the icefalls defending the mountain were necessary to find a practicable route. Camp I was four miles from Base Camp, at 16,500 feet, and Camp II, at 18,300 feet, on a col below the south face of the peak. From here the route led up a steep snow col about 600 feet high, on the top of which we intended to camp below the ridge leading to the northern summit. The first part of the climb appeared difficult, but we felt that given five days' clear weather we had a good chance of success. On August 20, after fixing ropes on the lower 300 feet of the col, we were forced to retreat in a snowstorm. During the ensuing five-day storm one of the porters became ill. As soon as possible we evacuated the camps and got the sick man down to Base. Our time was now too short for a further attempt on Lupke Lawo Brakk. Accordingly, G. and D. Greenald, on August 27, climbed an unnamed peak of 19,300 feet on the south side of Snow Lake, a difficult ascent by alpine standards. The Greenalds and our Pakistani liaison officer then left for home down Hispar Glacier. Durbin and Williams, the latter now recovered from a five weeks' illness, remained behind to explore peaks at the head of Sim Gang Glacier. We were favored by fine weather, and after a two days' march from Base placed a camp at 18,500 feet, on the Lupke La. During the next four days the two mountains on either side of this pass were climbed. The northern peak, 20,340 feet, was a difficult climb of mixed rock and snow. The ascent of the southern peak, 19,780 feet, was a straightforward snow climb. We left for home on September 13.

The main scientific work was concerned with the action of the adrenal cortex in the process of acclimatization to high altitudes. Daily investigations were made on the members of the party throughout the whole period of the expedition. In addition, a day-to-day record was kept of hours of sleep for comparison with similar records from polar expeditions. Observations of pressure, temperature, and humidity were made at as many surveyed heights as possible to verify the relation between true height and height estimated from meteorological data. The rate of melting of snow at various points on Snow Lake was measured. Geographical features liable to change, such as glacial snouts, were photographed for

comparison with earlier records. Samples of soil were collected in the valleys for subsequent bacteriological analysis.

J. DURBIN, *London School of Economics Mountaineering Club*

U. S. S. R.

Pic Pobeda, Tien Shan. The second highest peak of the Soviet Union, Pic Pobeda (Peak of Victory), 24,407 feet, is reported to have been climbed in 1956. This peak was discovered in 1937, attempted in 1938, and surveyed in 1943.

Mustagh Ata, Sinkiang. The Russians also report the ascent of 24,383-foot Mustagh Ata, July 31, 1956, by an expedition under leadership of E. Beletsky, made up of 19 Russians and 12 Chinese. Our honorary members, H. W. Tilman and E. E. Shipton, reached within a few hundred feet of the summit in an attempt in September 1947.

Africa

Punta Margherita, Ruwenzori. The first ascent of the west face of the Punta Margherita, the highest summit of the Ruwenzori group, was made by the 73-year-old Piero Ghiglione and three other Italians (ethnologist Giorgio Gualco, cameraman Giorgio Brigatta, and guide Ernesto Franchez) on March 25, 1956. The difficult, extremely steep ice face below the 16,923-foot summit is 2000 feet high. Our French member, Bernard Pierre, in 1956, also reached the summit of this peak as well as the Punta Alberto.

Club Activities

EDITED BY FREDERICK O. JOHNSON

A. A. C., Cascade Section. Excellent weather during the summer of 1956 enabled many members to do some good climbing in the mountains of the Pacific Northwest. Among the more notable climbs was a second ascent, with a variation, of Mount Rainier's Ptarmigan Ridge by Fred Beckey and party. Several section members went farther afield. Pete Schoening, Don Claunch, and Leon Blumer were in a party that attempted the Pioneer Ridge on Mount McKinley and were stopped at about 15,000 feet by a combination of bad snow conditions, weather, and lack of time. Dr. Otto Trott was in a party that reached about 12,000 feet on the East ridge of Mount McKinley, the route Dr. Cook claimed that he climbed. Fred Ayres climbed in Peru and later in Mexico. Dick McGowan ran the guide concession at Mount Rainier, and Willi Unsoeld guided in the Tetons. Several members participated in mountain rescue work in conjunction with the Mountain Rescue Council.

Two informal meetings were held when John Oberlin visited Seattle in July and Francis Farquhar in September. At the annual meeting on September 29 George Senner, who recently returned to this area after a five-year absence, was chosen chairman of the section. Following a short business meeting, an excellent illustrated talk on the Cordillera Blanca of South America was given by Dr. Walther Hofmann, a photogrammetric engineer from Munich, Germany.

The section was saddened by the passing of Bill Degenhardt on November 15. Bill was an active climber and skier the year around, and he could be found in the mountains nearly every weekend.

CORNELIUS M. MOLENAAR

A.A.C., Rocky Mountain Section. During 1955, members of the Rocky Mountain Section gathered for three pleasant evenings to meet distinguished mountaineering guests. In March we were privileged to hear Professor Noel E. Odell review some of his climbing in the Himalayas and New Zealand and to see some of his excellent slides. In May we had the pleasure of a dinner with Bradford Washburn to listen to the story of his reconnaissance of Mount McKinley and to view his beautiful slides of that mountain. In November we had an informal meeting with Francis Farquhar and were entertained by his

recent experiences in Europe and stimulated to produce contributions to future numbers of the *American Alpine Journal.*

STEPHEN H. HART, *Chairman*

A.A.C., Sierra Nevada Section. Early in 1956 the Sierra Nevada Section proposed that an informal A.A.C. camp be held in an effort to promote increased contact among club members. The Tetons were chosen as the site, because of their relatively convenient location and the wide number of climbs they afford. The idea was endorsed by the Council, and during the last two weeks of August 40 persons, including 13 members, attended the Teton camp. The new, spacious campground at Colter Bay was used the first week, but was replaced the second week by the Jenny Lake campground, which, although more crowded, was better located as a starting point for most of the climbs. Orrin Bonney and Don Woods were on hand for both weeks, and those who attended for a shorter time included Eleanor Bartlett, Phil Bettler, Francis Farquhar, Horst von Henning, Neal Jacques, Fred Johnson, Paul Kenworthy, Mel Marcus, Howard Parker, Ross Petrie, and Phil Smith. Climbs were limited by unfavorable weather the last week in August, but included the East Ridge and Exum routes on the Grand Teton, the seldom done traverse of Teewinot to Mount Owen, Cloudveil Dome, Rock of Ages, Rockchuck, Mount St. John, and Symmetry Spire. Also, Paul Kenworthy accomplished what was probably the first successful navigation of the Grand Canyon of the Snake River in a foldboat.

The section held three meetings during the year. On March 10 Norman Dyhrenfurth met with the group to talk on the accomplishments of the 1955 International Himalayan Expedition to Lhotse. On May 30 Raffi Bedayn entertained 18 members and 25 guests at his Orinda home, where a sumptuous feast, featured by barbecued lamb, was offered. Bob Bates kindly lent us the films of the 1953 American K2 Expedition to highlight the evening program. The final meeting of the year was held on December 1, when Bob Swift gave a well illustrated account of the 1956 attempt on Rakaposhi. Officers for the 1957-1958 term elected at that meeting were: Frederick O. Johnson, Chairman; Raffi Bedayn, Vice-Chairman; Dr. Howard G. Parker, Secretary-Treasurer. The section also helped sponsor a successful program by Edmond Denis on August 8. Mr. Denis showed two films, "Skiing in Chamonix," and one giving an account of the remarkable French climb in 1954 of the great South Face of Aconcagua.

FREDERICK O. JOHNSON, *Secretary*

Appalachian Mountain Club. A major effort to clean up deferred maintenance on the Club's extensive trail system was carried out in the summer of 1956. The huts were visited by more people than ever. Lectures, as usual, were popular and included climbing in the Himalayas, highlighted by an account of the first ascent of Kangchenjunga; Peru, the Alps, Antarctic, Hawaii, and Africa. The usual numerous outings to points in the East were carried out, as well as trips to Hawaii and runs on various western rivers. The August Camp was located at Maroon Lake, in the Elk Mountains of Colorado. Extensive programs of rock climbing, ice climbing, and canoeing were carried out successfully and introduced new members to these sports. Members were active in diverse ranges such as the Rockies, Alaska, Mexico, the Andes, Iceland, the Alps, and Scandinavia.

K. A. HENDERSON

The Alpine Club of Canada. This was the Jubilee Year of the Club, which was founded in 1906. In consequence the annual summer camp was held at one of the historic sites connected with early Canadian mountaineering, at Glacier, British Columbia, in the heart of the Selkirk Mountains. This site, where the old original Glacier House stood, had the great advantage of easy accessibility for the old-time members, as it is only a little more than a mile from the main line of the Canadian Pacific Railway. It also had the advantage of being a first class rock-climbing region. The good metamorphosed schists of the Selkirk peaks were a pleasant change from the friable shales and limestones of the Rockies. We were also blessed by two weeks of perfect weather—a rare occurrence in the Selkirks. The camp lasted from July 16 to 29. A total of 189 registered for the camp, including a number of original members and some who had attended the first camp 50 years before—a fine tribute to the longevity of mountaineers.

A great deal of climbing was done on all the nearby peaks, and the "big" peak of the region, Mount Sir Donald (10,818 feet), came in for a lot of attention. It was climbed by no less than eight parties, on as many different days, for the most part by the famed Northwest Ridge. The mountain was in splendid condition, which permitted one especially fine climb of the West Face, with descent by the Northwest Ridge. The participants were Dr. Jo Kato, of Edmonton, and Dolores LaChappelle.

We were most happy to welcome many of our American friends and members, including Ed Porter, Don Woods, and Henry Kingman

and his son. Although the main campsite was low (4090 feet), excellent trails led in all directions, and one was always able to reach timberline without having to bushwhack—a great boon, as Selkirk bush is notorious.

As usual the Club also conducted a very successful ski camp at the Columbia Icefields during the Easter vacation. Conditions were average for the time of year; Winter ascents were made of Mount Wilcox by a party of four and of Snowdome (11,340 feet) by four ropes totaling 13 skiers. Snowdome is of special interest as it is the apex of the Canadian Rockies. Its slopes form a triple divide, with glaciers flowing to the Arctic, the Atlantic, and the Pacific basins. Unfortunately, high and very cold winds prevented this group from enjoying the wonderful panorama to the full.

During the 1956 climbing season our local sections have carried out extensive climbing programmes in their nearby mountains. The Calgary, Edmonton, and Vancouver sections are especially active in this regard. Vancouver Section members also took part this fall in the successful search and rescue operation carried out for a young Scotch climber who was lost on Mount Seymour for six days. Some of our members also took part in the big mountain rescue exercise organized by the Washington State Mountain Rescue Council at Snoqualmie Pass in June.

The Club records with deep regret the passing of our former American Vice-President, Captain Albert H. MacCarthy. As recently as last August "Mac" spent a few days at the Club House in Banff. He will be greatly missed, but his great record of outstanding first ascents, including the climbs of Mount Logan, Mount Robson, Bugaboo Spire and many others, will stand for all time.

E. R. GIBSON, *President*

Chicago Mountaineering Club. The Chicago Mountaineering Club continued to expand its program of local outings in 1956 by holding several winter weekend trips to the regular climbing areas of Devils Lake, Wisconsin, and Mississippi Palisades States Park, Illinois, in addition to the usual warm-weather trips. Eighteen outings in all were held, with attendance ranging from eight during one weekend when the temperature dropped to –8° F, to 45 on several summer trips. As the club holds western camps only in odd-numbered years, many members were able to participate in the climbing activities of other mountaineering clubs. Fifteen members attended the Alpine Club of Canada camp at Glacier, B.C.

Early in 1956 the directors of the club instituted a new program designed to control climbing activities more firmly by qualifying and designating certain members as rope leaders for local outings. As a result of this program and the work of the outing and safety chairmen, accidents were held to a minimum, with only one injury recorded for the entire season.

Non-climbing activities were limited to the publication of the "Newsletter," regular monthly meetings during the spring and fall, and a family picnic and dinner in November, attended by over 100 people. Club membership in 1956 totaled about 150, with 65 percent from Chicago and its immediate vicinity.

WALTER I. MARCH

Colorado Mountain Club. For the third successive year the Colorado Mountain Club held two outings. The out-of-state outing, under Carl Blaurock, traveled to the Sierra Nevada for two weeks with the hope of climbing the 14,000-foot peaks in the Palisade Group and the mountains to the south. Owing to rainy weather, however, only six high peaks were climbed by the 22 club members who participated in the outing. The Colorado camp was held for one week at the abandoned mining town of Pittsburgh, in the West Elk Mountains. It was a "drive-to" camp and proved its popularity by attracting a group of 90 people under the leadership of Glenn Gebhardt. An enjoyable feature was the trip to West Maroon Pass to meet 22 members of the Appalachian Mountain Club who had hiked over from their Maroon Lake Camp.

The technical climbing schools sponsored by the various groups of the C.M.C. continue to be among the most popular activities. William E. Davis reports that 94 members registered in the Denver school. He calls attention to the need for the development of qualified leaders; the total pool of 14 leaders was not sufficient to provide intensive training for intermediate candidates, as it barely met the demand for beginners. His committee believes that in teaching safety measures and elementary rock techniques the school has filled a definite need in the club.

The fourth and easternmost of the Chessmen, the Knight, east of Buffalo Creek, was ascended for the first time, in August 1956, by Stanley Rickard and Don Spaulding, who used pitons and three drive studs. The second ascent, September 15, was made by Cary Huston and Dale Johnson by the south crack, using wooden wedges. Following the same route as the August party, Allen Auten, Phil Johnson, and Bill Rathbun made the third ascent, October 20. The route followed

the western ledge to the shelf, with a southern horizontal traverse and short rappel to the base of the 80-foot east chimney. Descent was made by a 60-foot and a 40-foot rappel.

For the second time C.M.C. climbers were called upon by United Air Lines to assist in the recovery of bodies and wreckage at the site of a crash. Allen Auten, Charles Pavlik, and Fred Welch, all experienced C.M.C. technical climbers, and David Lewis and Ray Batson, of the Rocky Mountain Rescue Group at Boulder, were flown on July 3 and 4 to the site of the wreck of the UAL-TWA collision which occurred June 30 over the Grand Canyon. Colorado climbers worked together with eight Swiss mountaineers, who were flown to this country by Swissair as a goodwill gesture of the Swiss airline. C.M.C. climbers remained in the area until Sunday, July 8, helping with the salvage operations.

With further surveying completed by the U.S.G.S. on the *Buena Vista 2 Quadrangle,* Huron Peak, in the Swatch Range, was announced as the 54th Colorado peak over 14,000 feet in altitude. During the summer many parties were organized to climb this peak, and on Huron's busiest day 40 people climbed to the top. Another result of the survey showed that Mount Harvard exceeds both Mount Massive and Mount Rainier in height. The official order of the five highest peaks in the United States is now: Whitney, in California; Elbert, Harvard, and Massive, in Colorado; and Rainier, in Washington.

Programs for annual group meetings were enlivened by the movies and color slides of the 16 club members who in early May rode the Colorado River with Bus Hatch from Lees Ferry to Lake Mead. Club members also attended three lectures in Boulder: an account of the 1954 French ascent of Aconcagua's South Face, by Edmond Denis; a talk by Noel Odell, of the Alpine Club; and an account of the first traverse of Mount McKinley, in the spring of 1954, by Leslie Viereh.

The Board of Directors took great pleasure in presenting every C.M.C. member with a copy of the club's latest publication, "Notes on Mountaineering in the Elk Mountains of Colorado, 1908-1910," by Percy Hagerman. Publication of this manuscript, which was prepared for the club by Mr. Hagerman in 1912, has long been hoped for and was made possible by a gift from United Air Lines and with the cooperation of the Denver Posse of The Westerners.

ANNE B. KENYON, *Executive Secretary*

Iowa Mountaineers. The club enjoyed an unusually active year. Sixteen week-end climbing outings were sponsored, which attracted over

500 active participants. The popular Sunday afternoon hikes and horseback outings were continued. Nineteen professional adventure-film lectures were sponsored, which included such famous explorers as Norman Dyhrenfurth and John Goddard. The club's two professional travelogues, "Alpine Echoes" and "Lure of Alaska," were shown to many large audiences in Iowa and neighboring states. A lecture course on "Outings and Mountaineering" was again sponsored and was well attended.

A three-weeks outing to the Canadian Rockies was sponsored in August, with 50 members participating in the eleven-day Assiniboine Camp and 31 members registered for the seven-day outing along the Banff-Jasper Highway. Sixteen different mountains were ascended, with a total of 20 different members climbing Mount Assiniboine and a party of three making the fourth ascent of the northeast face of Sunburst Peak. A number of elementary and advanced rock, snow, and ice practice-sessions were sponsored on the outing.

Many club members participated in outings of other clubs as well as in private expeditions. Eight members climbed Devils Tower in Wyoming, six climbed the Stettner Ledges on Longs Peak in Colorado, and two members ascended Shiprock in Arizona.

JOHN EBERT

Mazamas. The climbing school has become one of the most important programs of the Mazamas and was improved greatly this past year; 447 people registered for the course. The school is open to the public as well as to Mazamas. Bill Oberteuffer directed the school and will continue to handle the 1957 program. The two-weeks Annual Outing was held in the Goat Rocks area. The Climbers' Outing again went to Cascade Pass, where the group continued their activities from 1955. The climbers ascended Eldorado, Johannesburg, Sahale, Boston, Magic, and attempted Forbidden, Mix-up, and the Tripletts, all in one week. The regular climbing season covered the major peaks in the Northwest with 965 persons on 49 climbs.

In the spring, the Mazamas co-sponsored the Northwest Wilderness Conference in Portland. In support of research, we did our part for the International Geophysical Year by making an aerial survey of the Northwest's glaciers from Mount Rainier to South Sister in Oregon.

Our participation in the Mountain Rescue and Safety Council of Oregon called for three searches and one rescue mission. The rescue was in connection with the serious accident which involved the entire party of 19 climbers from the American Youth Hostel while they were de-

scending Mount Hood. The accident claimed twelve litter cases in addition to one death. There were six broken backs and one fractured skull, but there were no permanent injuries. More than 32 Mazamas participated in the rescue efforts.

JOHN BIEWENER, *President*

The Mountaineers. Climbing in 1956 took members of The Mountaineers to peaks from the Sierra Nevada to Mount McKinley. Its climbing committees in Seattle, Tacoma, and Everett programmed ascents of some 75 peaks in our Cascade and Olympic mountains. This was in addition to private climbs by many of the club's 3500 members and to non-technical trips scheduled by the club. More peaks were bagged on The Mountaineers' summer outing to the Minarets area of the Sierra, the Climbers outing to the Palisades area of the Sierra, and the Campcrafters Outing to the Selkirks of Canada.

No expeditions were sponsored by the club this year, but individual members took part in several. Mountaineers Pete Schoening, Al Randall, Al Krup, and Don Claunch joined Keith Hart, of College, Alaska, and Leon Blumer, of Vancouver, B.C., in an assault on Mount McKinley via the difficult Pioneer Ridge. They were turned back at 15,000 feet by weather and lack of time, but not before they had determined that the route was feasible. Mountaineers Dr. Otto Trott and Dr. Paul Gerstman, led by Walt Gonnason of Seattle and accompanied by Bruce Gilbert of Yakima, were turned back at approximately the 12,000-foot level on Mount McKinley. Examining the claim of the late Dr. Frederick A. Cook to the ascent of McKinley was the main interest in the attempt.

Closer home, first failure, then success greeted attempts at the first ascent of Mount Rainier's Ptarmigan Ridge route in 20 years. [Described elsewhere in this issue—ED.]

Beckey, Staley, Rupley and Wes Grande reported the first ascent of the West Black Butte, one of the volcanic arêtes that flank the west slope of Mount Baker.

In the twenty-second year of its climbing course, The Mountaineers gave basic and intermediate instruction to 400 students. Safety was accented heavily in the course. Safety programs also included cooperation with the Mountain Rescue Council, installation of rescue kits at key mountain sites, reports to the membership on accidents, and provision of wallet-size cards with emergency instructions for rescue. The mountains were kind this year in Western Washington. The weather was excellent. The accidents were few.

Much time was spent this year on preparation of a major text on climbing. It will contain possibly 500 pages, including more than 100 pages of drawings and other illustrations. Publication plans now are under way, and it is hoped that the book will be ready in the next year for distribution to members and other climbers.

PAUL WISEMAN, *President*

Sierra Club. This year Sierra Club climbers roamed many of the great mountain areas of the world in search of climbing. Foremost was an attempt on Rakaposhi (7790 meters) in the Karakoram by a British-American party, including Club members Richard Irvin and Robert Swift. This team reached a new high point of 23,500 feet, but as is often the case, storms ended their push for the summit. Previous to this Irvin had climbed in New Zealand and in addition to several ascents produced a new route on Mount Cook. Not to be outdone, Bob Swift completed a few climbs in Wales on the way home.

Closer to home, climbers from the San Francisco Bay Area made a first ascent of Mount Snowside (9600 feet) in the area south of Bella Coola in the Canadian Coast Range. This group included Will Siri, Jim Wilson, John Dorsey, George Whitmore, Dave Rynin, and Dick Houston. Rock climbers were also active: spectacular Spider Rock, in the Southwest, fell to Southern Californians, and another new route was completed in Yosemite Valley, on the west side of Liberty Cap above Nevada Falls. Although heavily climbed, Yosemite still offers some new routes. Foremost is the sheer North Face of Half Dome. This gigantic wall has now been attempted several times, and at least one party is planning to lay siege in 1957.

On more organized fronts, the club conducted mountain trips to the Tetons and the Glacier Peak area of Washington. Possibly the most ambitious club-sponsored trip was led by Al Baxter, with assistance from Bruce Meyer, Dick Long, and Leigh Ortenburger. This trip penetrated into the area east of Mount St. Elias, in Canada. Although stopped by weather from reaching any summits, this group brought back glowing reports about the area, as well as of the management of the trip. The final days were spent rafting the large river that drains this area.

Another phase of climbing has been the continuing work of the Mountain Rescue Committee. In addition to local practice sessions in the San Francisco Bay area the Committee published a translation of some European rescue material. The Committee was also involved in one rescue attempt in Yosemite Valley. Although still on a limited

scale, it is felt that the rescue group will extend its activities in the near future.

RICHARD C. HOUSTON, *Chairman, Mountaineering Committee*

The Southwestern Mountaineers. 1956 was a year of growth for the Southwestern Mountaineers, of Las Cruces, New Mexico. Composed primarily of students, professional, and military personnel from Las Cruces, White Sands, and Fort Bliss, the group has grown to a total of approximately 30 members.

While most of the rock climbing activity has taken place on the granitic spires of the Organ Mountains, which overlook the vast Tularosa basin of southern New Mexico, the club has roamed far afield for its major accomplishments of the year. Summer months saw club members make four ascents of Shiprock. During the Christmas holidays, ascents were made on Pico de Orizaba and Popocatepetl, in Mexico.

Mountaineering activity has not been limited to rock climbing. Three times in the past year, club members have participated in mountain rescue operations in the Organ Mountains. Two inexperienced climbers, who had suffered serious injuries in the rugged Organs, were carried to points where helicopters from the White Sands Proving Grounds were able to pick them up and transfer them to medical aid. A third rescue saw club members remove an unconscious teen-age boy from a mine shaft into which he had fallen. As a result of club rescue activities, a close cooperation exists among the authorities of White Sands Proving Grounds, the Dona Ana County Sheriff's Department, and the Southwestern Mountaineers.

RONALD A. HAHN

Spokane Mountaineers. A seasoned organization founded in Spokane in 1915 makes its *AAJ* debut in this report. It was easily predictable that a climbing club should have an early start in such surroundings as those accessible from Spokane. Here within range for week-end trips are the Idaho Selkirks, the Montana Cabinet and Mission ranges, and the Washington Cascades. Longer outings often reach the Tetons, the Oregon Wallowas, and the Canadian mountains. Our natural winter headquarters is 6000-foot Mount Spokane. A cabin with ski-tow facilities is in use there now, and a J-bar lift is planned.

Our "peak baggers" had a very successful 1956 season. Instruction preceded climbs on Rock Peak, in the Cabinets; Mount St. Helens, Mount Index; Mount Shuksan; and Chimney Rock, in the Idaho Panhandle.

The summer outing was the season's highlight. From base camp in Cascade Pass a small group enjoyed unusual climbs. The best climb traversed the flank of 7000-foot "Pelton Peak" to its narrow east saddle. This viewpoint makes a photographer gasp. Far below are the Prussian-blue waters of Trapper Lake, dotted with ice floes and seemingly accessible only by plane. The frowning scarp opposite, features 7300-foot Glory Mountain, the last unclimbed peak shown on published maps of the Washington Cascades. And close by is Trapper Peak, which was first climbed in 1949 by Harvard's George Bell, Andy Griscom, Harry King, and Graham Matthews. Its impressive 3000-foot north face almost duplicates the great face of the Grand Teton.

Glory Peak was of particular interest in 1956, for its west ridge finally yielded to Bill Fix and Dick Whitmore on August 3. The climbing never exceeded fourth class, but the height climbed was nearly equal to the full elevation of Glory above sea level. The victors had little energy left to build a cairn, but the thought that they had closed a minor frontier in Northwest mountaineering was indeed stimulating.

WILLIAM C. FIX

Wisconsin Hoofer Mountaineers. The activities of the Hoofer Mountaineers for 1956 included three major trips to western areas in addition to regular Sunday practice climbs at Devil's Lake State Park, Wisconsin. These bluffs are an ideal place to quench one's thirst for climbing in lieu of the real thing. To instruct novices, the club has offered various brief talks and exhibitions on mountain safety, rescue, and snow techniques. These talks, presented by different club members at each session, have been received very well and are enlightning as well as entertaining. They range from knot-tying sessions to mechanical and seemingly complicated techniques for hauling a person from a crevasse.

Concerning western trips: the first, during late March and early April, was a premature attempt by four over-anxious individuals to rush the season. We ended up in the Needles of the Black Hills, scrambling among the pinnacles; then moving on to Devils Tower, which we merely looked at in a blizzard and went home. The second of our trips was more successful. This more or less annual June trip to the Tetons brought several beginners who all fared well. The usual ascents were made, including Grand Teton, Cloudveil, Teewinot, Nez Percé, Storm, Ice Point, and Symmetry Spire. Our third and longest trip, at the end of August, took us north and west to Glacier Park, B.C., in the Northern Selkirks. Among notable features were the running of two major ridges by Oscar Strickholm and Arkel

M. Erb; the Hermit Ridge, from Rodgers to Hermit, including the Truda peaks; and the Asulkan Ridge, consisting of seven peaks. In the Hermit group Tupper, Sifton, Grizzly, Cheops, and Cougar were climbed, all by the usual routes. In the Sir Donald group, Avalanche, Eagle, Sir Donald, South Terminal, and Green's Peak were climbed. A group hiked to the Glacier Circle cabin, in the Dawson group, but because of bad weather there was merely a good attempt on Mount Selwyn. Bob and Peggy West, who made the first ascent of Fortitude this year, missed us there by only a few days.

While the group was away in Canada, other club members were not idle. One weekend in August, J. Calvin Giddings, Bob Snider, and Bob Powers climbed Devils Tower and distinguished themselves as the first Hoofers to do it. The weekly practice climbs went on throughout the summer and will continue, to a lesser degree, throughout the winter.

SUSAN F. WARD

Dartmouth Mountaineering Club. The DMC was very active during 1956, particularly in the West. The focal point of this activity was the Teton area, where club members climbed for six weeks in the summer. Among the many climbs was the first ascent of the north face of Red Sentinel, by Gerry Cabaniss and Barry Corbet, in the third week of August. This route starts 20 feet east of the chimney which forms the northwest corner, and proceeds straight up to a belay ledge three feet wide. From there the route is mainly a difficult traverse to the last part of the regular route, which is followed to the summit.

In early September Jake Breitenbach, Charles Plummer, and Barry Corbet climbed the lower Exum Ridge of the Grand Teton as far as Wall Street. Weather precluded the completion of the climb, but the climbers regarded it as the most enjoyable in their experience. Other noteworthy climbs were the Jensen Ridge of Symmetry Spire and the south buttress of Nez Percé. Three attempts on the south buttress of Mount Moran were turned back by weather. On the return trip East, Breitenbach, Plummer, and Corbet stopped at the Needles in South Dakota. They made a new "route" (one 30-foot pitch) on Balcony Point and made numerous first ascents on the smallest pinnacles. Breitenbach and Corbet also climbed Devils Tower, in Wyoming, the same week.

In New England the DMC conducted its regular rock climbing classes. New routes on Owls Head and Whitehorse Ledges were worked out, and the Laurentians and Shawangunks saw limited action. At present the DMC

seems to be riding a boom of enthusiasm and for this reason is making ambitious plans for the future.

BARRY CORBET

Harvard Mountaineering Club. Last summer found club members relatively inactive in comparison with the activities of the summer of 1955. There was no major expedition organized by the club to South America or to the Himalayas, nor was there a climbing camp. However, several members were on independently organized expeditions. A party composed of Mike Wortis, Steve Jervis, Leo Slaggie, and Dave Toland attempted to climb Mount Assiniboine, but was turned back by bad weather conditions. The party then went to the Tetons, where its members climbed Symmetry Spire by the Jensen Ridge and the Durrance Ridge. Jervis, Wortis, and Toland then visited Devils Tower, which they climbed by a route recently laid out by Army climbers.

Ken Henderson organized a trip to Iceland which included Caspar Cronk and Frank Gaebelein. Hvannadalshnukyr, Hekla, Herðubreið, Snaefell, and Loðmunder were the major peaks climbed. Earl Whipple, after attending the Canadian Alpine Club camp at Glacier, B.C., climbed in the Coast Range. With another climber, he climbed high on the south face of Mount Waddington, spending one night on the face before turning back for lack of iron. Other members climbed in northern British Columbia and in Alaska.

Locally, the club had an active fall season. Besides trips to nearby rocks with instruction for beginners, there were excursions to the Shawangunks in New York and to Mount Washington in New Hampshire. The club continues to stress safety, giving first-aid classes and belay practice. A telephone line was laid in Huntington Ravine to supplement the first-aid cache which was installed last year. Plans for the 1957 summer include another climbing camp to train new leaders and to introduce some of the younger members to expedition mountaineering. The club also hopes to have a small party in Peru.

CASPER CRONK, *President*

MIT Outing Club. In addition to the frequent practice climbs held locally, a summer trip was made to the Tetons, in Wyoming. Using Jenny Lake and the MITOC hearse as base camp, eleven of us made eight ascents of Teton peaks in August. The climbs included Symmetry Spire, Middle Teton, Storm Point, Ice Point, South Teton, Grand Teton, Mount Woodring, and Peak 11,266.

GARDNER PERRY, III

Princeton Mountaineering Club. As in the past, Princeton's location has forced the PMC to concentrate its attention on rock climbing. Within this limitation it maintained an active schedule of week-end trips to faces at the Shawangunks, in lower New York, and to Stover State Park, in Pennsylvania. The purchase of a group car eased some of the perennial transportation problems, though it raised some others peculiar to itself. A trip in early February to Mount Washington provided a break from exams (much appreciated) as well as reminding the participants of snow, ice, and cold weather technique. As usual the HMC generously allowed us to use the Harvard Hut. Tom Tifft, Guy Williamson, Tee Tirana, and Brooks Fenno found the weather at the top a surprisingly mild 10°F, a rare circumstance, reflected in the absence of frostbite cases.

Most important for the club's future was the formation of a Graduate Board consisting of former PMC members. We expect to see this become a valuable adjunct both to the undergraduate and to alumni addicts, for it provides an easily accessible source of varied mountaineering news and experience. Though no formal expedition was organized by the club in 1956, many members undertook trips on their own: David Stern and Frank Knight in the Canadian Rockies, Bob Manning in the Tetons, and John Wharton in Wales. The account of an expedition to the Central Selkirks led by William Putnam of Springfield, Mass., which included George Townsend, James Burrows '53, and David Isles '57, may be found in *Appalachia,* December 1956.

DAVID ISLES, *President*

Stanford Alpine Club. Most of the practice climbs were rained out during the winter. During Easter vacation, however, members drove to Nevada to climb Montgomery Peak (13,465 feet), on the California-Nevada border, and then proceeded to the Hot Creek Range in the central part of Nevada. Here, five peaks over 10,000 feet in altitude were climbed for the first time, and many fifth-class pinnacles were scaled. Yosemite Valley was the site of numerous spring climbs, and a practice-climb schedule was maintained for learners. The club's only official summer outing was in the Selkirks of Canada, where Sir Donald, Uto, Eagle, and Avalanche were climbed. Members also ascended Victoria Rock and Snowpatch Spire, in the Bugaboos; Mount Baker, Mount St. Helens, Mount Rainier, Mount Shuksan; and the Mönch and the Jungfrau, in Switzerland. Practice climbs were resumed with the beginning of the fall quarter in September. Week-end trips to Tuolumne Meadows, Yosemite Valley, and Pinnacles National Monument were made. In November several members made a Thanksgiving

ascent of Mount Shasta. Over the Christmas holidays a group skied and hiked into Desolation Valley, west of Lake Tahoe, to climb Pyramid, Jacks, and Dicks peaks.

KARL HUFBAUER, *Secretary*

Mountain Rescue Council, Seattle, Washington. Bolstered by local climbers, many of whom are active members of A.A.C., as well as by hundreds of civic-minded citizens and business firms, MRC continued during 1956 its program of rescue, rescue training, and mountain safety education. In addition to the more basic functions of the organization, MRC has contributed generously of its members' time to aid in the establishment of many other rescue groups in the Pacific Northwest. Operating independently (but as affiliated organizations) climbers in Everett, Bellingham, Central Washington, Hood River, and Longview now have active rescue teams of their own. Other groups are in process of forming in various communities in the region, including Canada. Mountain rescue has decidedly "grown up" in the Northwest, and as time goes on there will be few climbing areas where rescue assistance will not be available in a matter of hours. Constant striving toward better training methods and acquisition of specialized rescue equipment are two areas of activity in which MRC is strengthening its position. A trip by A.A.C. member Kurt Beam to Europe has provided liaison between the United States and rescue groups in the Alps. Kurt made direct connections with a supply source in Bavaria through which MRC is obtaining high-grade equipment at a fraction of the cost required to duplicate it here. (See Appendix to this report.)

A number of training sessions were held. A.A.C. member Bill Degenhardt, who passed away in December 1956, was vice-chairman of MRC and as chairman of the training committee was active in the training sessions. His efforts will be greatly missed in the future, and his past devotion and contributions will always be remembered. Sessions included a carabiner brake and pulley practice, a map and compass field course, a winter practice, and a two-day spring training conference. Some of the outlying MRC units also held several sessions. The spring training conference in June was staged at Snoqualmie Pass, in the Source Lake area. This was a full dress rehearsal, complete with helicopter participation by the Coast Guard. Observers and participants came from Oregon, Washington, Colorado, and Canada. A week prior to the practice three dummies were spotted high on a ledge above Source Lake, which lies at the foot of a boxlike valley. Search teams scoured timber and rock and snowfields at

the head of the valley and climbed as much as 1000 feet above the lake. Poor visability, owing to fog and clouds, revealed a need for better intra-group communications. When the dummies were discovered, MRC knock-down litters were carried in and the evacuation begun. The descent involved rather hazardous terrain, with steep snowfields and rock cliffs. The younger, less experienced members were given the actual job of evacuation, while the more experienced members observed and took notes for a detailed critique which was held later, back at the Pass. A new phase of support was brought into this operation by the Explorer Scouts, who set up an efficient "canteen" at Source Lake for serving hot coffee and sandwiches. Considering that mid-June in the Cascades is not characterized by bright sunshine and mild temperatures, the Explorers' efforts were appreciated indeed. Max Eckenburg and other Explorer leaders are continuing their work to get the Scouts well grounded in support tactics for searches and rescue.

Dorrell Loof succeeded Pete Schoening as MRC chairman early in 1956. The board members included Bill Degenhardt, Ome Daiber (re-elected) Kenn Carpenter (Everett), Ira Spring, Arnie Campbell, and Dr. Otto Trott.

The MRC mountain safety educational film, announced last year, has been completed by Bob and Ira Spring and will be available soon for showings to youth groups, clubs, and schools. Ome and Matie Daiber play major roles in the film. Financing was provided by a fund-drive conducted over a several-year period.

MRC put in a very active and worth-while year answering emergency calls which took teams to the Olympics, Mount Rainier, and various other locations in the Cascades. A new type of mountain activity arose during the year: the search for and rescue of victims of military jet aircraft crashes. Two pairs of jet fighters crashed into rugged, tortuous terrain, and MRC, in conjunction with military and civil authorities, spent many days in the field on search missions. Of eight Air Force flyers involved, three survived. These unfortunate accidents underscore the need for greater cooperation between MRC and the military in order to cope as effectively as possible with future situations.

WARD C. WILLIAMS

Appendix to MRC Report. A working relationship has been established between rescue personnel in the Pacific Northwest and rescue authorities in the Alps. The countries concerned formed an International Commission for Alpine Rescue, which is also known as IKAR. One of the many divi-

dends which this cooperation will pay is in the purchase of specialized as well as standardized equipment directly from Munich and Innsbruck. Such an example is a sectionalized avalanche-probing pole. The Mountain Rescue Council of Seattle and the local Region of the National Ski Patrol System have ordered a number of these probing poles. They will be carried in the regular emergency equipment caches in this area, and individual probes may be sold to members at cost. Construction is of strong, lightweight steel, and the weight approximately ½ lb. There are two sizes: four 3-foot sections and four 2-foot sections. A handy cloth-and-leather carrying-case envelopes the knocked-down sections. The sections screw together and can be tightened with a key. The key is stitched in as an integral part of the carrying case and hence cannot be lost. This probing pole is a great improvement over previous types, which are either too heavy or too cumbersome, especially in the case of the one-piece poles which are difficult to transport over long distances and rugged terrain. The shorter models are ideal for ski-touring parties in case a hasty avalanche search is necessary.

Another exciting piece of specialized gear is the "Akja," which is the latest word in Alpine evacuation equipment. It has been approved by all European Rescue Organizations and is now standard equipment there. The Mountain Rescue Council at Seattle has acquired an Akja, which promises to be of great utility and value in future rescue operations. Construction is of aluminum. It comes in three sections. For winter use, all three sections are used, to permit a greater bearing-surface in snow. It is used as a "boat," and ski attachments are not necessary. For summer use the center section is removed, and only the end sections are used. This shortened model serves excellently for rock and ice evacuations, in which case it rests on steel runners which can easily be attached to it. For movement over trails a portable bicycle-wheel can quickly be added. Two sets of handles are included, a long pair when the Akja is used as a toboggan, a short pair for summer use. There are also attachments for the use of cables in the case of aerial evacuation. The Akja is said to be the "Cadillac" of mountain evacuation equipment and it has a multitude of features which other litters do not have. It can be carried in sections, has a built-in splint, protects the victim from rock and ice, can very easily be loaded, and its construction makes it comparatively easy to carry a casualty over long and difficult terrain of all kinds.

The cost of a complete Akja is about $125 plus freight. Both the probing poles and the Akja can be ordered from the Bavarian Red Cross Prasidium-Referat Bergwacht, Munich 22, Wagmuellerstrasse 16, Ger-

many. Since this is life-saving apparatus which is used by non-profit organizations, no difficulty has been encountered in receiving this equipment duty-free.

Glaciers

Glaciers in the Pacific Northwest. The advance of many glaciers in the Pacific Northwest is continuing. This year it was necessary to alter our route to the Coleman Glacier measurement-stations because advancing ice discharging over some cliffs, which even last year were below the terminus of the Roosevelt Glacier, had made the previous route unsafe. Photogrammetric measurements were made this year as usual. Topographic maps of the Coleman-Roosevelt Glacier area on Mount Baker have been completed for the years 1954 and 1955 by Dr. Walther Hoffmann, of Munich, Germany, from the photograms taken in those years. From these maps, it was determined that there was an increase of 170 million cubic feet in the volume of the glaciers between 1954 and 1955. It is expected that when the map for 1956 is completed, it will be found that an even greater increase will have occurred between 1955 and 1956 at elevations below 6000 feet, but that there may have been a loss above 6000 feet, due to an unusually dry and sunshiny summer. The 1954-1955 volume increase took place almost entirely below 6000 feet elevation, the height of the surface of the glacier remaining virtually constant above that elevation.

KERMIT B. BENGTSON

Book Reviews

EDITED BY HARRIET T. PARSONS

A Climber's Guide to the Teton Range, by Leigh Ortenburger. Illustrated by Eldon Dye. San Francisco: The Sierra Club, 1956. ix, 159 pages; ills.; maps and diagrams. Price $3.00.

In this long-awaited guide to the Wyoming Tetons, Leigh Ortenburger has done a superlative job of accurately labeling and describing the intricacies of Teton routes and variations of routes, while generally avoiding the danger of lapsing into the confusing minutiae of a hand-hold-by-hand-hold account. The author's own intimate knowledge of the range, gained during several seasons there as a professional guide, has been reinforced by four years of intensive search for climbing records in periodicals, as well as by personal questioning of the climbers who pioneered new routes. The result is a guidebook whose accuracy in technical and historical detail is unequalled, in this country at least.

Eldon Dye's detailed drawings of the routes provide a clarifying accompaniment to the text. The photographs are a striking introduction to jagged Teton grandeur, and offer, in addition, a fleeting glimpse of the outstanding pioneers of the range. Whether one is enjoying Teton climbs for the first time, or is revisiting them after many years of familiarity, the interest of the climbs is bound to be greatly enhanced by having at hand this compact little book of Leigh Ortenburger's.

WILLIAM UNSOELD

The Conquest of Mount McKinley, by Belmore Browne. Foreword by Vilhjalmur Stefansson; introduction by Bradford Washburn. Illustrations by Belmore Browne and Bradford Washburn. New Edition. Boston: Houghton Mifflin Company, 1956. xxx, 381 pages; ills.; maps as endpapers. Price $6.00.

Belmore Browne's text is identical with that of the original edition published in 1913. But there are several useful additions. Inside the covers are maps by Erwin Raisz which show the routes of approach by the 1906, 1910, and 1912 expeditions, from Cook Inlet, to the southwest, southeast, and northeast sides, respectively, of Mount McKinley. Washburn's introduction includes a fine sketch of the late Belmore Browne's life. There is a frontispiece from a photograph by Washburn of the Muldrow side of the mountain. There are fewer photographs than in the original

edition; La Voy's are omitted, but are replaced by some by Washburn, added to those by Browne. The illustrations are printed by offset, on the same paper as the text, and are interspersed in the proper positions to accompany the narrative.

The publisher is to be congratulated for making this classic of American mountaineering available again. For years it has been almost impossible to obtain a copy, and if at all, usually at a price far above that of this new edition.

Mount McKinley itself has changed very little in fifty years; only the manner of the approach. As an epic in the history of mountain exploration, wilderness travel, and arctic mountaineering, this is one of the great tales of all time. This book should enjoy a larger circulation now than when it was originally published.

HENRY S. HALL, JR.

Arctic Wilderness, by Robert Marshall. Edited, with an introduction, by George Marshall. Foreword by A. Starker Leopold. Berkeley: University of California Press, 1956. xxvi, 171 pages; ills.; maps. Price $3.75.

Here is truly a book of mountaineering, but not in its limited sense of technical rock or snow-climbing, for the late Bob Marshall, although a notable mountaineer in his own field, probably would not have known how to use a piton, yet he spent months on successive trips exploring and living in one of the most rugged of mountain systems, the Brooks Range, in northern Alaska. *"Arctic Wilderness,"* marvelously written, is a thrilling narrative of Marshall's adventures on his several expeditions into those mountains in the nineteen-thirties; but even more, it is the philosophy and message of a man who feels that the justification for modern-day wilderness pioneering, whether it be climbing mountains or exploring remote areas, lies mainly in what it contributes to the personal happiness of the explorer rather than what it may materially add to the good of the human race. His is a thesis that I think will appeal to many mountaineers.

The reader cannot help but be moved by Marshall's feeling for his beloved mountains, a feeling typified by the following passage, "Every mountain was covered with snow, every peak showed a clean white edge set against pure blue. Almost everything in life seems to be at least somewhat blurred and misty around the edges and so little is ever absolute that we felt a genuine exultation in seeing the flawless white of those summits and the flawless blue of the sky, and the razor-edge sharpness with which the two came together."

During his arctic travels Marshall explored vast heretofore unknown areas afoot, by boat, and by dog sled, seeing for the first time and naming whole river- and mountain-systems. He made numerous mountain ascents on these trips, but a great challenge to him remained in Mount Doonerak, discovered by him and thought at that time to be the highest summit in arctic America. Marshall failed in his attempts to climb Doonerak, but in the harmony of an Alaskan wilderness he found an inspiration never provided by what he called "the great thumping, modern world."

WILLIAM W. DUNMIRE

Give Me the Hills, by Miriam Underhill. London: Methuen & Co., 1956. 252 pages; ills. Price 25 s.

This book will be enthusiastically received by all who respond with a hearty "For me, too!" to Miriam Underhill's exclamatory "Give me the Hills!" Hardly anywhere in the literature of mountaineering can one find such a joyous tale of first-class climbing, coupled with nostalgic description and chuckling humor. That the climbing is first class is amply demonstrated by such virtuosities as the first ascent of the Aiguille de Roc and the traverse of the Aiguilles du Diable and by climbs in the Dolomites, culminating in the "Via Miriam" on the Torre Grande. It was no chivalrous concession that admitted Miriam to the élite *Groupe de haute montagne.*

Miriam O'Brien was fortunate in her initiation to mountaineering. It was fostered by her mother, who herself was an ardent mountaineer—she became a member of the A.A.C. about the same time Miriam did. The choice playground of New Hampshire's White Mountains gave Miriam her "first taste of the wild, uncrowded places of earth," and "even at six years old" she liked it. Her introduction to the Alps was gradual, at first by a series of family visits; but in 1926 she began her series of difficult climbs, first in the Dolomites, then among the Chamonix aiguilles, followed a few years later by big climbs in the Oberland. The most distinctive part of her Alpine experience was a series of "manless" climbs, notably a traverse of the Grépon with Alice Damesme. After a manless climb of the Matterhorn, in 1932, also with Alice, Miriam went to the Eastern Alps, "to join Florence and Dean Peabody and Robert Underhill for some guideless—not manless—climbing. After that, for nineteen years, my constant companion on every climb was Robert Underhill. Manless climbing is fun for a while, but this other arrangement is better!"

The latter part of the book is in a different key, a more enjoyable one for the reader as well, it seems, as for the climbers. Alpine techniques

give way to Western ways and the pack animal makes his appearance. There is some first-rate pioneering in the mountain regions of Idaho and Montana, together with a number of first ascents among hitherto unapproached summits. Ranchmen and woodsmen are introduced and prove themselves close kin to the villagers and guides of the Alps. And the bears: " 'Look down there!' I gasped. 'Grizzlies, all right,' said Bob in a whisper. . . . At once I was keenly conscious that there were no bars or barriers of any sort between them and me. No zoo, this. Here the Underhills and the grizzlies stood on an equal footing, each of us free to go wherever we like all over this mountain and the country around."

Finally, there are some thoughts, well put, for us to share and keep with us on our own journeys among the hills: "I enjoyed once more that glorious sight of miles upon miles of rosy peaks. I like to be high. Why is it that climbers feel uplifted in spirit as well as in body when they have climbed to heights? . . . Perhaps there is a relationship between the satisfaction gained and the effort expended." The book closes on a characteristic O'Brien-Underhill note: "Some time it would be fun to be with Adolf [Adolf Rubi, Grindelwald guide] in Montana and watch him cope with the underbrush and the pack-horses. We have been trying our best, with tales, to put him in the proper frame of mind—terror—about those grizzly bears." Thanks for the book, Miriam.

FRANCIS P. FARQUHAR

Starlight and Storm. The Ascent of the Six Great North Faces of the Alps. By Gaston Rébuffat. Translated by Wilfred Noyce and Sir John Hunt; technique section translated by Ronald Le Grand. Foreword by Sir John Hunt. New York: E. P. Dutton & Co., 1957. 189 pages; ills.; map; diagrams. Price $5.50.

Club members satiated with hundreds of books on the Alps will be delighted and thrilled with this one—as is attested by the redoubtable translators. It describes only the toughest climbs of them all. With shivering fingers and shivers down the spine the reader works his way past verglas and overhang, facing numbing bivouacs which culminate in a series of hard-won victories on six of those famous north faces that used to make the headlines back in the 1930s. And it is all told with a charm and a modesty sure to appeal. The author, certainly unique among guides, has gained fame from the glaciers of Annapurna to the pages of *Life*, and is the producer of a moving picture film bearing the same title as this volume. Those who have met him on his recent visits to this country are to be envied.

Besides the basic fact of translation, the make-up of this book, from the Anglo-American viewpoint, has been greatly improved from the original French edition previously reviewed in these pages, *AAJ,* 1956. It also includes a substantial section, "The Beginning Climber—The Technique of Mountaineering," not found either in the original French edition or in the London edition.

ROGER S. WHITNEY

Mont Blanc to Everest, by Gaston Rébuffat, with a preface by Wilfred Noyce. London: Thames and Hudson, 1956. 158 pages; 69 photogravures, including 8 in color. Price 35 s.

This is the English edition of Rébuffat's *Du Mont Blanc á L'Himalaya* translated by Geoffrey Sutton from the French. The text is brief and the style difficult. It is by no means a continuous story, but rather, occasional incidents with an attempt to draw a word picture therefrom: why men climb, or the beauty to be found in mountains. These word sketches are rather too attenuated to produce fully their desired effect and are apt to leave the reader gasping for imagination. What the text lacks, however, is made up by the pictures. Except for eleven reproductions of nineteenth-century illustrations in the text, they are full page or even double page, bled to give the largest possible picture area. The subject matter covers everything from hut life, an early start, and bivouacs, to some of the finest Alpine, Himalayan, and Alaskan scenery. Those who enjoy interesting and beautiful pictures of the mountains will find this book a real delight.

K. A. HENDERSON

Kangchenjunga: The Untrodden Peak, by Charles Evans, London: Hodder and Stoughton, 1956. 187 pages; 5 pages of color and 32 pages of black and white illustrations; 5 large diagrams; 2 maps. Price 25 s.

Kangchenjunga is a great mountain book. Unpretentious, it has to an extraordinary degree the feeling of expedition life on a great mountain. Charles Evans shows himself to be an observent, colorful writer, as well the best kind of leader. The story moves ahead—vigorously. We get the smells and sounds of camp life as the Sherpas push toward the mountain. From the time when Norman Hardie sights through the theodolite to learn the altitudes of different rock outcrops on the Yalung Face until he and Tony Streather, blue from lack of oxygen, return to meet Charles Evans above Camp V, the book is superb. It is full of the sound of ava-

lanches, the feeling of remoteness from the rest of the earth, the fierce beauty of shadow and ice and rock. We sympathize with the exhausted climber who puts one leg in his sleeping bag and then must take a long rest before he can tuck in the other one. We understand the momentary panic of a tired, heavily loaded rope-leader on tricky snow when the lining of an oxygen mask suddenly shuts off the supply. We can even see Joe Brown and George Band, ready for the final attack next day, sleeping at Camp VI in a tent so "precariously perched" that they themselves are roped to a "spike of rock." Adding to the flavor are diagrams, many fine photographs, and excellent appendices. Danger and beauty, courage and pleasure in discovering the route are revealed with sensitivity and modesty. Again, this is a great mountain book.

ROBERT H. BATES

On Climbing, by Charles Evans. New York: A. S. Barnes & Company, 1957. 191 pages; 33 plates; 6 pages of maps; numerous pen-and-ink drawings. Price $5.00.

"The mountains and the hills are there to be discovered; and whether they are the boys' crags of heather, or the great ranges untrodden since they were made, always they entice us to know them, to master all that bars the way; to them a part of us belongs." *On Climbing* shows that a considerable part of Charles Evans "belongs" to the mountains, and in this book he does his best to help us "master all that bars the way." *On Climbing* is an extremely readable, easy-to-understand book on mountaineering techniques and equipment. It is slanted at the young climber in the British Isles, but what it says is so sound and clearly presented that no veteran climber anywhere can fail to find useful lore in it. This is no mere textbook. Analysis of techniques and climbs are delightfully interspersed. In more or less chronological order we progress from scrambles in the Berwyn hills to the first ascent with Dawa Tensing of the Kang Cho Shar. Always there is modesty and companionship and deep happiness. Perhaps the book's best feature is the large number of Evans' own pen and ink sketches of techniques and routes. He is particularly good on step cutting and on the pleasures of bivouacs. Many Americans will be pleased with his praise of the Logan tent and interested in his comments on the Tarbuck knot, "approximately 30 per cent stronger than a bowline when tested to breaking point by slow loading."

Whether Charles Evans is climbing the north face of Snowdon in the winter, traversing the Täschhorn and Dom in the summer or reconnoitering the Chola Khola in the fall, one recognizes what a splendid mountain

companion he must be. His concluding words about hills and mountains speak to us all, ". . . once we have seriously played with them we can never let them be."

ROBERT H. BATES

La Montagne. (Published under the direction of Maurice Herzog, with the collaboration of Courthion, Couzy, Escarra, Franco, Grandpierre, Kempf, Languepin, Neltner, Samivel, de Ségogne, Stoupy, Veyret.) Paris: Larousse, 1956. 476 pages; ills.; maps; index. Price 6200 Fr. francs (approx. $18.00).

Pursuing its course in the grand tradition set in the mid-nineteenth century, Librairie Larousse has produced one of the most comprehensive volumes on mountains and mountain environment to reach the public. By its very title, which implies treatment of the subject in its broadest sense, one could only expect collaboration by a carefully selected group of authorities in order to appraise the varied facets which, taken together, present the story of mountains and their impact on the human race. The effort has been well worth-while.

This is not a book to be read; rather, it is an encyclopedia to be consulted. It is a tool for the geographer, the historian, the economist, the physiologist, the artist, the philosopher—and the mountaineer. Compiled by French authors, it is natural that emphasis should be placed upon regions and regional characteristics best known to French observation, experience, and accomplishment. This being the case it is inevitable that the quality of text will suffer as intimacy with the subject declines. The North American consultant will be upset by misspellings of too many of the peaks of our western cordillera, confused by the inaccurate conversion of mountain heights to the metric system, and surprised at distortions of history. But it is our home ranges, perhaps, that will least interest American readers, and in so vast an undertaking, errors of this kind can be excused, if not overlooked.

The value of *La Montagne* lies not in the dotting of "i's" but in the assembly within one cover of such a spectrum of information, world-wide in scope and total as concerns the mountain environment. The publishers are to be warmly commended on this volume. The maps are numerous and adequate, the hundreds of photographs well selected and well reproduced, and the twenty-five full-page color plates are so beautiful that the book is worth having for their sake alone.

WALTER A. WOOD

Les Alpinistes Célébres by Henry de Ségogne and Jean Couzy. Paris: Editions d'Art Lucien Mazenod, 1956. 416 pages; 221 plates (8 in color). Price 6200 Fr. francs (approx. $18.00).

In vast conception and noteworthy execution, the editors and 71 collaborators have compiled a volume, half of which consists of 81 biographies of famous mountaineers, few of whom are now living, interspersed with sections on Alpine history. This is followed by chapters dealing with the conquest of peaks outside the Alps, and a summary of important first ascents and routes. The index refers to a total of 3200 climbers, with a further index of 1560 peaks. The result is as if the far earlier work of Cunningham and Abney, "The Pioneers of the Alps" (1887), had been expanded into a *Who's Who* of global mountaineering.

In such an immense task the editors are limited in the selection of what shall be included. The larger biographies are well chosen, but one wonders why such figures as Martin Conway, J. P. Farrar, E. Fontaine, E. F. Norton, Achille Ratti, and the Workmans are not among them. The text is divided under such headings as: Forerunners; Literary and Scientific Alpinists; Alpinism as a new aspect of Humanism; First Guides; Founders of Sporting Mountaineering; Guideless Climbing; Mountaineering beyond the Alps. As one might expect in any attempt to cover the entire world, there are errors in the spelling of place and personal names, and in several cases, of historical fact. It is the magnificence of the full-page plates that impresses one, particularly the excellent portraits of the early climbers. The illustrations include the triptych carried by Rotario d'Asti to the summit of Rochemelon in 1358, the 16th-century woodcut of Mont Aiguille, and the inspired portrait of Conrad Gesner by Tobias Stimmer. The youngest mountaineer in the formal biographies is Georg Winkler, who died on the Weisshorn in 1889 at the age of 19, and whose body was recovered during the past summer. It is curious that several, Mummery and Zsigmondy among them, who met early death on the peaks, stressed in their writing the dangers of our sport.

J. MONROE THORINGTON

East of Everest, . . . an account of the New Zealand Alpine Club Himalayan Expedition to the Barun Valley in 1954. By Sir Edmund Hillary and George Lowe. New York: E. P. Dutton and Company, 1956. 70 pages; 48 pages of photos. Price $5.00.

In April, May, and June 1954, a New Zealand expedition explored the region south and east of Mount Everest: specially, the Imja, Hongu, Choyang, Iswa, and Barun watersheds. Nineteen peaks over 20,000 feet

were ascended, but not without a few unsolicited thrills. Baruntse, 23,570 feet, and Pethangtse, 22,080 feet, were the two highest peaks climbed. Several passes were traversed for the first time, notably the Imja-Barun crossing. The story of Jim McFarland's fall into a crevasse and his subsequent severe case of frostbite should be an incentive for all mountaineers to study appropriate rescue techniques so that they may be employed quickly and skillfully. George Lowe devotes a chapter to "Dumji, a five-day festival," which is an interesting sketch of part of the Sherpa's environment. Members of the expedition were: Sir Edmund Hillary, Dr. Charles Evans, Dr. Michael Ball, Bill Beavan, Geoff Harrow, Norman Hardie, Jim McFarlane, Colin Todd, Brian Wilkins and George Lowe. Total cost: about £ 8000.

ALLEN STECK

White Fury (Record à l'Himalaya), by Ramond Lambert and Claude Kogan. Translated from the French by Showell Styles. Foreword by Maurice Herzog. Appendices by Albert Zimmermann and Dr. Franz Lochmatter. London: Hurst and Blackett, 1956. 175 pages; ills. Price 18 s.

This is a story of a post-monsoon reconnaissance of Gaurisankar, 23,440 feet, and Melungtse, 23,564 feet, and an attempt on Cho Oyu, 26,750 feet, in the fall of 1954. Lambert and Mme. Kogan relate their experiences in alternate groups of chapters, a device that offers the reader a "stereoscopic" view of expedition activities. Although the chapters sometimes overlap, this style is none-the-less a pleasant innovation, especially in view of the authors' varied approaches to description.

Finding access to the sumits of Gaurisankar and Melungtse too complex an undertaking, Lambert's party travels to Cho Oyu. Here they are faced with a delicate decision, for Dr. Tichy's Austrian expedition is found to be already engaged in ascending the peak. Lambert lets each member of his party voice an opinion, but it is Lambert who leads the discussion to a decision not to attempt the mountain until the Austrians have had their chance: "In mountaineering there is a kind of law that puts competition . . . out of the game. There is a chivalry of mountains, a moral code none-the-less binding for being unwritten."

The book concludes with an account of the Austrian's climb of Cho Oyu and the desperate attempt on the same peak by Lambert and Mme. Kogan that failed because of terrible winds some 1100 feet below the summit. The story is well told, although it has lost some of its flavor through translation. Among the routine descriptions of expedition life one finds passages

here and there that show a sensitive, lyrical appreciation of the scenes and events which unfold before the author's eyes.

ALLEN STECK

The Siege of Nanga Parbat, by Paul Bauer. London: Rupert Hart-Davis, 1956. 211 pages; 23 photographs; 2 maps. Price 25 s.

Paul Bauer, famous for his climbs on Kangchenjunga, was also closely connected with Nanga Parbat. He considered it as a climbing possibility in 1929, headed the rescue party sent to it after the '37 disaster, and was leader of the 1938 expedition. His small book gives a complete, though necessarily condensed, survey of the attempts on the mountain, including everything from the mid-nineteenth-century explorations of Adolf Schlagintweit, the first European to see the peak, to Buhl's solo climb to the summit in 1953. The style is clear, simple, and pleasant, with interesting and valuable comments on the mountain and its problems. The two maps are unusually well drawn and detailed, and the photographs, apparently selected from those of all the expeditions, include some that are outstandingly beautiful. Regrettably, occasional little mistakes have been made in the translation, and there is no index.

ELIZABETH KNOWLTON

Lonely Challenge, by Hermann Buhl. Translated by Hugh Merrick. New York: E. P. Dutton & Co., 1956. 318 pages; 19 ills.; 3 maps. Price $5.00.

Reading about Buhl's amazing solo ascent of Nanga Parbat, many people have wondered what sort of person he is, and what was his previous training. Now he himself supplies the answer. Only a portion of the book deals with the Himalayan adventure. The rest contains Buhl's autobiography as a mountaineer, relating many of his more interesting European ascents—from the Austrian Alps, through the Dolomites, to the Western Alps, and Chamonix. These are tales of magnificent climbs. They also give a vivid portrait of the man himself—a man driven and possessed to an exceptional degree by that familiar spirit of the mountaineer, the urge toward something always more and more difficult. Rock climbs famous for requiring teamwork he must tackle alone; snow routes renowned for their severity in summer he must conquer in winter; in weather considered impossible for climbing he must push through to the highest summits. Always he must drive himself to his limit, test himself at the very edge of the humanly possible. And always he finds intense enjoyment among the mountains—a keen pleasure in their beauties, a

good-humored relish for their amusing hardships, and, above all, that strong zest for difficulty and danger.

Nanga Parbat is of course the climax of Buhl's climbing life. Here he fills out with vivid pictures the account of his personal experiences and emotions already outlined in Herrligkoffer's book. But he strangely omits some pertinent details of that story, and does little to clarify many of its puzzling features. Notably, one is still left in the dark as to how it happened that, when Buhl was staggering painfully down the ridge back from his victory, and was for more than an hour apparently in plain sight of the tent of his good friends, Frauenberger and Ertl, they seem to have awaited him in camp, instead of starting up to meet and help him. The book does leave us, however, with one very strong impression that Hermann Buhl's survival on Nanga Parbat was a close thing at best, and that probably he would never have got himself down alive, if he had not had the rigorous training of those earlier climbs.

ELIZABETH KNOWLTON

Aconcagua: South Face, by René Ferlet and Guy Poulet. Translated from the French by E. Nowell Bowman. London: Constable, 1956. ix, 209 pages; ills.; maps. Price 25 s.

The climbs of Fitzroy, Huantsan, Chacraraju, Taulliraju, and Aconcagua establish the French as pre-eminent in Andean mountaineering. The seven-day ascent of Aconcagua is undoubtedly one of the great climbs of all time, both for the difficulties of the face itself and for the classic simplicity of the party's techniques: Alpine techniques on a "Himalayan" problem.

"We seek not the ever higher but the ever more difficult." "Thirst for battle and victory is the *leitmotiv* of climbing." Only such a spirit could have won such a victory, yet it is remarkable how few statements like the above occur in this book. Unlike some of the accounts by Nazi and Soviet Russian mountaineers, this story conveys not only the feeling of commitment, the tense refusal to compromise, but also the saving humor and effacement that elicit sympathy as well as admiration.

Ferlet writes the introductory section, including a useful summary of important ascents of Aconcagua. Poulet writes the story of the climb and its aftermath. His section is beautifully written. It contains much useful information on travel and climbing in the area, whose peculiar horrors include wind, dust, and rotten rock. Apparently a sine qua non is large quantities of liquor. The translation is generally good but irritating at some points, especially in the rendering of idioms and slang. For *"cordée"* one should use either "rope-team" or "rope," depending on the context.

On page 107 the translator, in citing an "error" in the account of a rappel, is himself in error. Nevertheless, it's exciting and enjoyable reading.

DAVID HARRAH

La Meije, by Henri Isselin. *Collection Sempervivum.* Paris and Grenoble: Arthaud, 1956. 262 pages; ills.

Henri Isselin, whose "Barre des Ecrins" was reviewed in *AAJ,* 1955, has now turned his attention to the Meije. He has given us an equally complete and even more fascinating work on this great Dauphiné mountain, once known in the local dialect as "Oeille de la Meidjour"; in other words, the Meije is merely another of the many Aiguilles du Midi scattered throughout the Alps! Alone among the great Alpine peaks, the Meije remained unconquered till 1877, and was finally climbed by the young Frenchman, Boileau de Castelnau, with the Père Gaspard, pioneer guide of the valley of La Bérarde.

Books as well documented and precise as this one sometimes tend to be dry, but Isselin writes with humor and the vividness of a man who knows and loves his subject. We follow the early pioneers on the mountain, the establishment of the classic route, the many successful and unsuccessful attempts on the ridges and faces. We hear of the tragic death of the young Austrian, Emil Zsigmondy, on the south face in 1885, and of its conquest 27 years later by his compatriot, Guido Mayer, with the famous Cortina guide, Angelo Dibona. We visit the Dauphiné valleys of the Romanche and the Vén Eon, La Grave and La Bérarde, the local huts and camping sites. We meet a wonderful collection of Alpine characters, beginning with Whymper, Coolidge, and the latter's strong-minded aunt, Miss Brevoort, who arrived in La Grave in 1870 with nephew, dog, and three Swiss guides, to make the first attempt on the Meije. We see de Castelbau's return 36 years later, with his three children, to the scene of his early triumph, and his touching reunion with his old guide whom he found hale and hearty, tending sheep above his native village.

The sketches and illustrations are excellent, and should be helpful to climbers wishing to study the different routes. In short, anyone who knows French and plans to visit the Dauphiné should not miss this book.

URSULA CORNING

Alps and Elephants, by Gavin de Beers. London: Geoffrey Bles, 1955. 89 pages; appendices and references; map. Price 10 s 6 d.

Gavin de Beers' very readable re-examination of Hannibal's route across the Alps begins by testing the original narratives of Livy and Polybius. By a

reasonable elimination of what seemed to be unjustified and arbitrary changes introduced into their translations by modern printers, he puts Hannibal across the Rhône near Arles, and then marches him up the east bank, not to the Isère, as so many of us have been led to believe. Instead, short of the Isère he turns him eastward up the River Drome; thence over the Grimone Pass to the Durance. Then, following up that river, he routes him off to the right up the gorge of the confluent Guil instead of over the obvious open Mount Genèvre route. In this way de Beers is able to conform the description in the two classical accounts with what is present-day topography.

At the very head of the Guil he takes the invaders over the Col de la Traversette. That must have been an astounding feat. That pass is over 9000 feet high, rising up on the shoulder of Monte Viso. But one of the principal reasons for holding to that pass in this analysis is that it is one of the three watershed passes from which one can see the plains of Piedmont, a fact referred to by both Livy and Polybius. But Hannibal and his army must have had wonderful stamina. Consider that they roamed over Italy from coast to coast for 15 years, living off the country without reinforcements, defeating the Romans three times, first at Ticinus, then at Lake Trasimene, and finally at Cannae. Included in the publication is a list of 31 earlier authorities, with an analysis of each of their proposed routes. I commend this book particularly to those who have traveled in the Graian Alps or who have visited the sites of Hannibal's great battles.

JOEL E. FISHER

Tents in the Clouds, by Monica Jackson and Elizabeth Stark. London: Collins, 1956. 255 pages; 24 pages of photographs; 5 sketch maps. Price 18 s.

Mrs. Monica Jackson, Miss Betty Stark, and Dr. Evelyn Camrass accomplished something new in the way of a Himalayan expedition—one organized and carried out—and with complete competence and success, —by women alone. Although theirs was a relatively small and modest expedition, still they explored the last large unknown area of the Nepal Himalaya, the Jugal Himal (where white people had never before entered), discovered hitherto unknown passes, corrected inaccuracies of the map, and climbed a new peak of more than 22,000 feet. The surprising aspect of this expedition is the technical difficulty of the terrain—glaciers, icefalls, crevasses—that they took on. I believe rocks have long been considered appropriate for women, but complicated snow- and ice-work has usually been man's field.

All this is written up in the most engaging way with an informality and intimacy rare in expedition books. We learn much more of the small but interesting details of personal relations, of finance—even, one might say, of housekeeping—than is usual; all of which brings us closer to the experience ourselves. This same simplicity and modesty, I am sure, extended to the whole conduct of the expedition and in particular to the relations of these girls with their sherpas and porters, whom they managed with considerable astuteness. The men, on their side, seemed to be rather intrigued with the situation and to enjoy the trip as much as the ladies.

MIRIAM UNDERHILL

The Moated Mountain, by Showell Styles. London: Hurst and Blackett, 1955. 255 pages; ills.; diagrams; endpaper map. Price 18 s.

Showell Styles is also known as Glyn Carr, author of *"Murder on the Matterhorn,"* and other detective stories and books on mountains. This time he has written the tale of his own Himalayan expedition. It is sad that the four sahibs and the four sherpas involved did not succeed in climbing Baudha, the moated mountain, in Nepal, but the fact does not affect the flavor of this delightful adventure story. From the moment the writer first meditates on Nepal by moonlight from the back of a sleeping cow to the moment when we find him adorned with flowers behind his ears celebrating his final "Rakshi" party in a remote Nepalese village, we are spirited away to that most entrancing of countries. This does not mean however, that there was not much serious climbing involved, and the writer has gone to much trouble to provide helpful information for future Nepalese expeditions. For mountaineers and non-climbers alike this book makes delightful reading, for it is well-written, humorous and vivid, and made one reader at least wish to take the next plane to India! Each section is prefaced by a Nepalese chant or dance, and the tunes are surprisingly charming and easy on western ears.

An excellent endpaper map makes it simple to follow the party's many attacks on the defenses of Baudha. Better luck next time!

URSULA CORNING

The Forbidden Mountain, by Fernand Navarra. Translated by Michael Legat. London: MacDonald & Co., 1956. 174 pages; ills.; maps. Price 16 s.

Mount Ararat is regarded with superstition in that part of Turkey. The story of the Ark seems to be accepted by all the local religions, and the

monks of a nearby monastery long identified a rock extrusion as the remains of the hull. Certain other more worldly persons of some repute have compiled "evidence" in support of the legend. It is therefore not surprising that six young Frenchmen decided in 1952 to explore the mountain and if possible discover the remains of the Ark. We are told on pages 166 and 170 that they did exactly that, but to this reader's prosaic mind it is not possible to be sure whether the statements are made seriously, and if they are, just how far from objectivity the author was carried by religious and exploratory enthusiasm.

Very little of the book is devoted to mountaineering as alpinists understand the term. The climb to the summit (16,946 feet above sea level) has no technical problems, but is arduous, for Mount Ararat rises 14,700 feet above the plains. Although the book is not recommended as mountain or scientific literature it has appeal in other respects. Many of the descriptions have the charm and freshness of the sincere amateur approach, although some of the phrases sound extravagant or unduly sentimental, perhaps due to the difficulties of translation. There is genuine interest for all in details of the archaeological wonders and legendary history of the region.

LAWRENCE G. COVENEY

A Picture History of Mountaineering, by Ronald Clark. New York: The Macmillan Company, 1956. 350 ills.; explanatory text. Price $5.95.

Mr. Clark, whose noteworthy "Victorian Mountaineers" and other related books have been reviewed in earlier issues, here presents his collection of scenes and portraits in the form of a pictorial history of climbing. Beginning with the early mountaineers, from Petrach to Placidus à Spescha, we pass through the early ascents of Mont Blanc from Saussure to Albert Smith, with the partially overlapping era of the glacialogists. Wills and the Wetterhorn, Artists and Photographers, Women Climbers, Whymper and the Matterhorn, Americans in the Alps, the Rev. W. A. B. Coolidge, are additional subjects, leading to climbing in areas beyond the Alps. Guides and more modern figures such as the Duke of the Abruzzi, Geoffrey Winthrop Young and Frank Smythe are given separate attention. A number of pictures will be familiar to readers of Alpine literature, but there are many novelties, particularly in the Victorian groups and portraits, in which more detailed identification would have been desirable.

Although there are no important errors or omissions, it should be noted that Dompjulian de Beaupré (Antoine de Ville) was Charles VIII's

military engineer, and for that reason was chosen to make the command ascent (1492) of Mont Aiguille, presumably because of his knowledge of scaling ladders and other artifical aids. The statement (p. 12) that Baillie-Grohman explored the Andes is incorrect. It is not mentioned that the three brothers Parker (illus. 108, text), in their 1860 attempt on the Matterhorn, were the first guideless amateurs on the mountain and the first to try from Zermatt. It is strange that the Workmans are not included among the early Himalayan climbers.

J. MONROE THORINGTON

La Strada e Questa, by Adolfo Balliano and Irene Affentranger. Bologna: Edizioni Alfa, 1957. 195 pages; 16 ills.; paperbound. Price 1300 lire (approx. $2.10).

This series of fifteen essays is written from an unusual angle. It draws attention to the mountaineering of ecclesiastics, and especially to the exploits of the abbés of the Aosta valley. We hear of St. Bernard (996-1081), patron saint of mountaineers, who ran away from France on the eve of his wedding day and was later responsible for the hospices on the Great and the Little St. Bernard passes. In the 18th century we find Father Placidus à Spescha, of Disentis, in the Upper Rhine Valley, who made six attempts on the Tödi, and finally at the age of 72 watched his companions reach the summit, unable to go all the way himself.

Every side valley of the Val d'Aosta seems to have produced a mountaineering abbé. Punta Gnifetti, on Monte Rosa, was named for Abbé Gnifetti, of Alagna, who made its first ascent in 1842. The "Mountain Bear" of Ayas, Abbé Gorret, was largely responsible for the first ascent of the Italian ridge of the Matterhorn, in which he participated in 1865, after Whymper's victory over the Swiss side. Abbé Bonin, of Pré Saint Didier, fired the imagination of the world by first saying Mass on the summit of Mont Blanc in 1890. Abbé Henry, an excellent climber and writer, put his native Valpelline on the map.

An essay is dedicated to Pius XI, the mountaineering Pope, and another to our own Rev. W. A. B. Coolidge, who climbed 1700 peaks during his life. His mountaineering career had started with his aunt Miss Brevoort and her dog, who possessed little nailed boots and whose name Tschingel is immortalized in the Tschingel Pass in the Bernese Oberland.

The little book is put together with much devotion and knowledge, and would entice any reader to go to Val d'Aosta.

URSULA CORNING

Médecine et Montagne, by Jean Rivolier. *Collection Sempervivum.* Paris: Arthaud, Masson et Cie., 1956. 204 pages; ills. Price 960 Fr. francs.

Dr. Rivolier, the physician with the 1951-1953 French expedition to the Adélie Coast of Antarctica and on the reconnaissance of Makalu in the fall of 1954, has gathered together a wealth of information, both useful and academic. While much of the book is devoted to a rather synoptic treatment of such basic topics as elementary human physiology, nutritional principles, first aid, and the physics of the atmosphere, the persistent mountaineer can find also a lucid discussion of the physiology of high altitude acclimatization and exposure to cold, of individual requirements for oxygen at various altitudes and levels of physical activity, of the characteristic physiological difficulties encountered high, and of the treatment and prevention of mountain maladies. Most of the material is technical, but it is also thoroughly practical. The reviewer is not aware of a comparable compilation in English. For anyone contemplating extended mountaineering ventures above 13,000 feet, *Médicine et Montagne* will prove rewarding.

NELLO PACE

The Ascent of Rum Doodle. By W. E. Bowman. New York: Vanguard Press, 1957. 141 pages; ills. Price $2.95.

This is the antidote for the indigestion that follows reading too many mountaineering books. It is the account of the conquest of the great Rum Doodle, 40,000 feet high, lying beyond the ranges, five hundred miles away in Yogistan. It has everything: a foreword by Sir Hugely Havering, A.I.S.C., M.P.L., an introduction by O. Totter, and a day-by-day account of the Expedition to end all Expeditions. It describes the frightful sufferings on the way, analyzes the innermost psychological reactions of the team of famous mountaineers and gives the antecedent histories that explain their reactions, and pays a touching tribute to the 3000 porters who accompanied the climbing party. It incorporates verbatim the courageous messages that the inspired Leader sent to the Committee, even when the situation looked darkest. Altogether, it is a book that this reviewer recommends to all serious mountaineers, and to those not so serious.

OSCAR R. HOUSTON

Alpine Ski Tour. By Robin Fedden. London: Putnam, 1956. 93 pages, ills.; map. Price 30 s.

Anyone contemplating a ski traverse of the Haute Route would certainly find much of interest and practical value in this glorified guidebook to one of the finest and most popular of the big Alpine ski tours. There is much

background material and there are large and superb pictures. All through the actual tour the author gives his attention to much more than the skiing and mountaineering problems—as well he may when an entire book is devoted to one ten-day tour. The most interesting of this to me was the historical material on the country traversed and the early uses of the passes to Italy. But the author concerns himself as well with life in the valleys below, the native inhabitants, birds, animal tracks, trees, and, of course, weather—to everything, curiously, except his companions on the trip who remain to the end merely names. This extensive accompanying detail provides much interest too, even to those people who are not at the moment embarking on this trip. There are superb pictures.

MIRIAM UNDERHILL

Zillertal und Alpbachtal, Ein Bildwerk. By Simon Moser. Innsbruck: Tyroler Verlag, 1956. Illustrations. Price 48 Sch.

Like all photo-books which Professor Moser has published, this collection of 89 pictures of Zillertal and Alpbachtal presents the scene through an artistic eye. We would mention especially the view of Zell from the Zellberg, in which the village and church emerge like an island through the mist and cloud, or that of the Stillup waterfall, like a painting of fairyland. There are many fine costume-plates of Alpbachtal valley, which developed a unique system of pattern and color in its peasant art. These valleys arise on the Italian frontier and enter the Inn from the south, the Zillertal at Jenbach and the Alpbachtal at Brixlegg.

J. MONROE THORINGTON

Karwendel, Schönstes Naturschutzgebiet der Kalkalpen. By Robert Löbl. Introductory trilingual text by Heinrich Kher. Innsbruck: Tiroler Graphik, 1956. 88 pages, 64 illustrations.

The Karwendel is a mountain area of Tyrol, comprising nearly 1000 square miles north of the Inn valley between Zirl and Jenbach. It extends to the Bavarian frontier and lies between the Achensee on the east and Scharnitz and Seefeld, on the Innsbruck-Partenkirchen line, on the west. As a climbing region it was largely the discovery of Hermann von Barth, whose book, "Aus den Nordlichen Kalkalpen" (1887), brought it to the attention of mountaineers. It is a region of alpland and limestone cliffs of great sheerness, such as the Laliderwand, and has retained its primeval character since it is not traversed by a driving road, the woodcutters' settlement of Hinterriss being the only dwellings inhabited throughout the year. The Birkkarspitze (9040 feet) is the highest summit, and there are luxu-

rious huts. A practical guide, with remarkable photographs, this book is in the same format as Kollreider's "Ost-Tirol" previously reviewed in *AAJ*, 1951, 9: 1.

J. MONROE THORINGTON

Winterland Tirol. By Robert Löbl. Trilingual text by Heinrich Kher. 80 illustrations by Viktor Herzner. Innsbruck: Tiroler Graphik, 1956. Price 80 Sch.

Uniform with the writer's "Tirol," "Karwendel," and "Kolomiten," we are carried in this book to the chief skiing centers of Tyrol: Kitzbühel, St. Anton, Seefeld, Hochsölden, Obergurgl, Mayerhofen, and others. The Skiklub Arlberg was founded in 1901, and Wilhelm Paulke organized the first ski courses for mountaineers at St. Anton in the same year. In the winter 1902-3 the Zugspitze, Wildspitze and Weisskugel were ascended on skis. Mathias Zdarsky, Col. Bilgeri, and Hannes Schneider were famous names. From December to April Innsbruck is the important center for the radiating wintersport valleys, which are splendidly depicted in this book.

J. MONROE THORINGTON

Eine Erinnerung in Bildern an das schöne Stubai, Tirol. 109 photo-illustrations, four in color. Innsbruck: Wagner'sche Univ.-Buchdruckerei, 1956. Price 44 Sch.

The Stubai valley, its upper extremity apposed to the heart of the Oetztal, reaches Innsbruck from the southwest. Its highest peak is the Zückerhütl (11,520 feet), and the group is rich in summits above 3000 meters. There are fine huts, of which the Franz Senn is the largest maintained by the Austrian Alpine Club. Railway from Innsbruck to Fulpmes brings one to the center of an attractive climbing area, with passes at the end of the valley, leading to the Oetztal. This book is a modern pictorial guide, with preliminary trilingual text.

J. MONROE THORINGTON

Neuzeitliche Bergrettungstechnik. By Wastl Mariner. 183 pages; sketches. Notes on first aid by Dr. Med Hans Seidel. Innsbruck: Tiroler Graphik, 1949. Price about $1.75.

In a country where mountaineering accidents occur quite frequently one might expect to find a lengthy, pertinent discussion of rescue techniques. "Modern Techniques of Mountain Rescue" contains a good deal of useful information listed under the following sections: (1) Construction and use of specialized and improvised equipment for rescue work. (2) Trans-

port of the injured with specialized and improvised equipment. Rescue methods are discussed for both summer and winter conditions, and there are sketches to facilitate understanding.

Nearly half of this paperbound manual is concerned with specialized equipment such as portable winches with steel cables and collapsible wheel-stretchers. Though this is useful in some mountain areas, the most important contribution of the manual is the section on improvised rescue equipment and methods.

ALLEN STECK

The Journals

With the ever increasing activity in world mountaineering it has become more and more difficult to keep abreast of the literature in book form, and many readers are turning to the journals with their abridged accounts of large-scale expeditions. The English language mountaineering periodicals now number more than twenty. Several of these, particularly certain ones published in Great Britain, are completely local in scope and therefore of such limited interest to most American mountaineers that their review will not be included here; a few others have remained unavailable to the reviewer. No attempt has been made to survey completely the contents of the following periodicals; accordingly, only those articles that seem to have unusual interest will be mentioned.

The Alpine Journal, May and November, 1956, London, presents a most impressive content with two *achttausender* expeditions heading its 432 pages. Leader J. Franco gives an account (English translation) of the French reconnaissance and ascent of Makalu in which all members of the party reached the summit over three successive days. In his description of Lhotse and Mount Everest, Swiss leader Eggler makes the understatement of the year: he writes that when the members below learned of the success on Lhotse, "We were very happy—!" Other Himalayan articles herein describe the second attempt on Masherbrum (failed at *ca.* 23,000 feet), an effort on Himal Chuli (stopped below 21,000 feet), success on the Muztagh Tower (two routes climbed, one by the British, and the second ascent by the French), two small Lahaul district expeditions, and one to the Rolwaling Valley, eastern Nepal. Extensive and up-to-date maps accompany all articles portraying areas not already well known. One especially interesting article (but fairly loaded with propaganda), by a Russian mountaineer, deals with climbing in the U.S.S.R. where, readers will be relieved to learn, "There is nothing new in Soviet climbing technique that we conceal from you, nothing that could be referred to as the 'secret

weapon' of Soviet climbers." The *A.J.* is rounded out with a variety of historical and Alpine records. Photographs are numerous and well above average in quality.

The Climbers' Club Journal, 1956, London, with an informal style and a format less pretentious than the *Alpine Journal,* nevertheless makes enjoyable reading throughout. Several pages from Band's Kangchenjunga diary make up the single Himalayan contribution. There is a description of the first ascent of the west face on Mount Kenya that ended in tragedy when one of the two climbers was killed by a fall on the descent, and there is a delightful narrative of "pegging" up the east face of the Grand Capucin (French Alps). Other articles cover climbing in Wales and the Alps. Illustrations are few and rather poor.

The Scottish Mountaineering Journal, 1956, Edinburgh, also features Kangchenjunga, already covered in the 1956 *AAJ.* The first all-female Himalayan expedition was made by three Scottish women to the Jugal Himal, mountains described by them as being "almost vulgarly sensational." The author, for some reason, wanted to cry upon reaching their 21,000-foot summit! This year's *Journal* actually has little to offer mountaineers, an impression strengthened by nine pages of mathematical formulas and logic seriously attempting to prove that it might be possible to view one Scottish peak (the Cuillin) from another (the Cairngorms) 100 miles distant (both are under 4000 feet elevation).

The Himalayan Journal, 1955-1956, Oxford, although it is the current edition, describes few expeditions more recent than 1954. The newer climbs recorded (Makalu, Kangchenjunga, Lahul, Istor-o-Nal) have also been described elsewhere. The 1954 reports include the American Makalu attempt, the Italian K-2 ascent, expeditions to Cho Oyu, Dhaligiri, and Rakaposhi, and the Batura Glacier reconnaissance. Although many of these articles are reprints from other publications, this journal certainly has the best offering for those with Himalayan interests. Photographs are numerous, but their reproduction seems a bit sloppy.

The New Zealand Alpine Journal, 1955, Christchurch, devotes forty-nine pages to Hillary's 1954 Barun Valley expedition. Their ascents of Baruntse (23,570′), Pethangtse (22,080′), and many lesser peaks, narrated by several authors, make good reading. Another Himalayan venture included in this journal is the Oxford University Exploration Club trip to western Nepal. Forty-six shorter additional articles dealing with the New Zealand Alps give a good sample of the wonderful home climbing opportunities down under. "Ten Years of Snow Caving in New Zea-

land" is an informative thirteen pages, with photographs and sketches of latest troglodytic techniques. The *N.Z.A.J.* is profusely illustrated.

Appalachia, December, 1956, Boston, is international in scope and presents the most varied fare of the American journals reviewed. It always gives the impression of being well edited. "Flight to Yesterday," by K. A. Henderson, believed to be the first account of climbing in Iceland published in the U.S., contains many informative bits and makes fascinating reading. With the recent activity in the northern Selkirks, some additions to W. L. Putnam's 1954 guide to that area which appear here should interest many. Other areas represented in this issue are the Lahul Himalaya and, of course, the Appalachian Range.

The Canadian Alpine Journal, May, 1956, Banff, as always, provides the best review for those whose interests lie to the north. Judging from this issue, however, 1955 saw less activity than usual among Canadian peaks, for the journal's main article-content is rather low in quantity. The feature story, other than a twenty-four page résumé of club activities over the fifty years since its founding, deals with first ascents around Queen Bess, in the Coast Range. Shorter reports are given of University Peak, Alaska, Strathcona Park, Vancouver Island, and the Leaning Towers, in the Purcell Range.

Mazama, December, 1955, Portland, and *The Mountaineer,* December, 1955, Seattle, are both slim volumes devoted to the Pacific Northwest. Aside from a short depiction of the third ascent of Mount Bryce, south of the Columbia Icefield, by F. D. Ayres, and an account of a Lake O'Hara outing, this issue of *Mazama* limits itself entirely to local mountaineering. Thirty-three routes are described in a climbers' guide to Three Sisters, Mount Washington, and Three Fingered Jack, while other short reports discuss climbing in Cascade Pass and the preservation of Glacier Peak as a wilderness area. In *The Mountaineer* D. Collins writes of some climbing experiences in the northern alps of Japan, and a new but small climbing area, the Big Horn Crags, in eastern Idaho, is described.

The Sierra Club Bulletin, December, 1956, San Francisco, has little to offer active mountaineers this year. Apparently 1955 was a rather inactive year for the club's members, and the lone climbing article, on the ascent of Robson's Wishbone Arête, has been covered in *AAJ.* The remainder of this journal is concerned with wilderness conservation and scenic descriptions. The marvelous photographs contained here continue to stand in a class by themselves; especially remarkable is a series of Alaskan wildlife reproductions.

WILLIAM W. DUNMIRE

Proceedings of the Club

ANNUAL REPORT OF THE SECRETARY FOR THE YEAR 1956

The first thought of a new secretary is to thank those who, much more experienced than he in the work and traditions of the Club, have given him such invaluable assistance. Of this group, I mention here only my predecessor, who naturally has been of the greatest aid, but my gratitude is none the less real to all the others.

In the past year the Council elected 22 Active and 5 Honorary members. We lost by death 6 members, by resignation 6, and 4 were dropped. There are now 476 Active and 12 Honorary members—4 of the latter are also Active members. Welcomed to Honorary membership in the past year were: Dr. R. Charles Evans, Brigadier Sir John Hunt, Eric Shipton, H. W. Tilman, and H. Bradford Washburn, Jr. Since the report at the last annual meeting we have lost by death Honorary Member Albert H. MacCarthy and Active members Mrs. Robert E. Peary, Mr. Edward Cushing, Commander Victor R. Fritz, Mr. Caleb F. Gates, Dr. J. W. A. Hickson. Mrs. Peary was the last surviving of the Founding members.

Although the Council would like to see a more rapid growth in membership, it has been made evident by members that they would oppose growth based primarily on reduced qualifications. However, it is believed that there are at least a hundred fully qualified American mountaineers who are not members. The obvious way of making your Club of greater national usefulness is to bring in more members from this group.

Our members have been active in all quarters of the mountain world. Probably the outstanding climbs were the North-northeast Ridge of Mount Cook, New Zealand, by Irvin and Robinson, and the climbs of five unnamed peaks in the Peruvian Andes by Ayres, Michael, Matthews, and Arnis. In the Himalaya the Club had only one representative, fortunately one of our most promising young climbers, who will tell us this afternoon about the latest attempt on Rakaposhi. His small party made up in skill and drive what it lacked in material resources. The Council feels considerable satisfaction in reflecting on the assistance the Club was able to give the lone member in getting to the Himalaya.

The Cascade, the Rocky Mountain, and the Sierra Nevada sections have continued activities with their customary vitality. The *AAJ*, as you have observed, prospers with an Editorial Board that spreads from Coast to

Coast. The Sierra Nevada Section again conducted a successful summer camp in the Tetons. The report of the Safety Committee is probably the most potent voice for sanity in mountaineering: it may well be the reason why there were fewer accidents in North America than in Europe. The *A. A. C. News* is now recognized as the one publication in North America that gets there first with the most news of actual mountaineering events, both in and outside the Club.

It is not news to most of you that the Club contains some members who have achieved honors in other than mountain climbing. We are proud that Dr. André F. Cournand shared the Nobel Prize in Medicine, and that David R. Brower received the National Parks Association Award.

The Council met four times, with an average attendance of ten. Among the more important subjects considered were: more effective representation from the western sections; a more positive conservation policy; maximum use of the Library by members everywhere; and the encouragement of and assistance to expeditions, especially those to regions where political, economic, and logistic problems are formidable. The Council believes it is making some progress toward solving these problems, but the economic and sometimes the political factors are not always easy of solution. That brings us back to the importance of having as members all qualified mountaineers of good character. As a national organization, it is only by growth that we can be of greatest service to fellow clubs and to mountaineering in general.

LAWRENCE G. COVENEY, *Secretary*

ANNUAL MEETING AND DINNER

Minutes of the 54th Annual Meeting of the American Alpine Club, held at the Museum of Science, Boston, Saturday, December 1, 1956—President Oberlin called the meeting to order at 2 o'clock, with 67 members present. The minutes of the last Annual Meeting were approved as published in *AAJ-1955*. Secretary Coveney then read his annual report which was approved. The newly appointed Assistant Secretary, Miss Helene Fleck, was introduced. Treasurer Fuller spoke briefly in interpretation of his annual report and expressed thanks to those who had made contributions in addition to their dues. It was voted to approve all items of expense and all investment transactions as set forth in the Treasurer's Report, which had been previously distributed to the membership.

The Chairman of the Conservation Committee, William S. Child, presented his report, with recommendations. It was noted that the Directors

had approved this report at their morning meeting. Discussion was invited, and a number of the members expressed favorable opinion. The report, with its specific recommendations, was unanimously approved.

The President invited attention to the presence of several members who had come from a distance: Mrs. Elizabeth Cowles, representing the Rocky Mountain Section, Western Vice-President Brower and Francis Farquhar, from California, and George Bell, from New Mexico.

Brief reports were made by the Editor of the *American Alpine Journal,* Farquhar, and by the chairmen of the following committees: Entertainment, Miss Ursula Corning; Expeditions, George Bell; Library, Walter Wood; Safety, and on behalf of the Medical Committee, Benjamin Ferris; Mountain and Cold Weather Training, Robert Bates; Research, Henry Francis. These reports were approved, with thanks to the committees for the excellent work done during the past year.

Mr. Wood announced that Gaston Rébuffat, noted French climber of the Alps and member of the Annapurna Expedition, would be in this country in March for a lecture tour. Requests for dates should be sent to him through the Club office.

Mr. Hall informed the meeting that Geoffrey Winthrop Young had reached his 80th birthday October 25. The members instructed the Secretary to transmit to Mr. Young the Club's greetings and cordial good wishes.

As no member of the Nominating Committee was present, the Secretary read a letter from Chairman Ralph Johnson in which the Committee unanimously nominated for Directors: George M. Austin, George I. Bell, Peter K. Schoening. No further nominations being made, they were declared elected. The meeting adjourned at 3:05 P.M.

Lectures. Bradford Washburn gave a fascinating illustrated talk on his analysis of the Cook-Mount McKinley controversy. Presented with his customary thoroughness and precision, this lecture had all the absorbing interest of a Sherlock Holmes case.

Kenneth Henderson showed his pictures of climbs in Iceland on which he was accompanied by Frank Gaebelein and Nick Clinch. This country, little known to mountain climbers, ought to receive more attention as a result of these beautiful slides.

H. Adams Carter took us in an opposite direction, to Chile, where the scientific expedition to the Ojos del Salado struggled with the usual obstacles (and some unusual ones) in measuring a mountain the altitude of which was in doubt. After seeing these pictures and hearing Ad Carter's narrative we found ourselves wishing that the mountain had turned out to be higher than Aconcagua.

Although the time allotted had already passed, practically all present insisted that Dick Irvin show his pictures of the Rakaposhi attempt. If, as Dick said, the best pictures were being shown the same night to the Sierra Nevada Section, most of us felt that the members in Berkeley were due for a terrific evening, especially if Bob Swift's presentation in any way compared with Dick's.

The Dinner—The dinner and the social hour that preceded it were most enjoyable, attended by 75 members and 108 guests. Whoever it was that Henry Hall engaged to cater should have a vote of thanks along with those tendered to Brad Washburn and the Boston Museum of Science. President John Oberlin, after introducing the guests of honor at the head table — among whom were Honorary Member Sir Hubert Wilkins and Major General Hayud Din of the Pakistan Embassy in Washington—presented Richard Irvin as substitute for Peter Robinson who had been scheduled to give an account of his New Zealand climbs. There followed a series of beautiful color pictures of spectacular new routes in the New Zealand Alps, in which Robinson and Irvin were accompanied at times by New Zealand climbers and their Scottish friend Hamish MacInnes.

Jürg Marmet came up to all our expectations as the final speaker. At least some of us found ourselves wishing it could be feasible more often to have speakers from among our fellow-climbers abroad — especially when accompanied by such attractive wives as Elsbeth Marmet. Dr. Marmet described the first ascent of Lhotse and the second ascent of Everest in his own natural style, without emphasis and with perhaps too much modesty in his desire to be thoroughly objective. His humorous sidelights were few but good — one, at least, was priceless.

The meeting was adjourned at 11:15, which gave an opportunity for many to express personally their appreciation to the Marmets and to visit among friends.

LAWRENCE G. COVENEY, *Secretary*

REPORT OF THE RESEARCH COMMITTEE

The following areas of activity have been engaged in by members of the A.A.C. Research Committee during the past year. This is a small beginning of what is hoped to be a steady growth of a program dedicated to supplying members of the Club with useful, interesting, and pertinent information about scientific research in and about mountain regions. At all times the comments of the general membership of the Club will be welcomed concerning specific or general suggestions for areas and programs

of a scientific nature about which they feel that this committee should give thought.

Preliminary meetings of the committee on the Arthur Gilkey Memorial Fund have resulted in the drawing up of a general program for the use and direction of the Fund. This action has enabled the committee to call in pledges made to the Memorial Fund, and to date $4500 has been received. It is hoped that in the near future the members of the Memorial Fund Committee will meet to conclude final arrangements for activities. Support and contributions are gratefully acknowledged. Every effort is being made to provide a program that will be creditable to the memory of Arthur Gilkey.

The Research Committee has given thought to the proposal that an Equipment Symposium be held in connection with the Annual Meeting and dinner, but it was found to be too difficult an undertaking for the present occasion. The proposed program has been forwarded to the Expeditions Committee for its consideration.

The Committee feels strongly that publication of information of a scientific character about mountain regions in *AAJ* is most worth-while. Much thought is being given to the types of material to be prepared for such publication.

In addition to these areas of activity, the Committee will consider by what means it may contribute further to the interests of the Club, and, in particular, to the interests of individual members and of expeditions to mountain regions in which scientific research may be a factor.

December 1, 1956.

HENRY S. FRANCIS, JR., *Chairman*

REPORT OF THE CONSERVATION COMMITTEE

The members of the Club have evidenced to this Committee a sincere concern for the protection and preservation of the high-mountain wilderness areas of North America. The extent to which the membership feels that the Club should become involved in helping to provide this protection has not been made clear to the Committee. The pressing needs for determining a Club policy in conservation should be apparent to all who are watching the current attempts at destructive legislation that are occurring at both state and national levels. The present period is a critical one in conservation—especially with an unfortunate government trend in the direction of reducing our national recreational park areas under the excuse that the increasing demands of a growing population requires it.

During the past year it has been the aim of the present Committee to attempt to clarify its own objectives and secure Council support for them. In consequence of this preoccupation nothing has been done by the Committee in the direction of constructive action in conservation. This sacrifice of time is no loss if in the attempt to clarify the Club's stand in the field, some conclusive points are reached. It is hoped that the present Committee, or its successor, can finally discover upon what authority it may act in the sense of truly representing Club opinion.

At this time the Committee is impressed by the fact that two groups of somewhat divergent views exist in the membership. One very active, very dedicated group, to whom conservation is a prime concern would have the Club become more aggressive in support of conservation measures. The other group, no less concerned about the preservation of our mountain wildernesses, feels that extensive action is outside of the Club's proper sphere of activity. Both groups recognize that because of our tax-free status there is an inherent risk in direct attempts to influence legislation. The active group feels that still within the law and with a minimum of risk we can afford to be more forceful as an influential organization, rather than confine our activity to the informal effort of individual members. The more conservative-minded group feels that the risk to the cherished interests of the Club is too great to justify more activity in the direction of organized action.

The Conservation Committee is at present occupied in trying to resolve these two points of view sufficiently to determine a policy upon which it may act constructively. It is felt that the problem will shortly be resolved so that worth-while efforts in support of conservation can be carried out.

With this basic difference unresolved, as Chairman, I should like to express my own feelings, apart from what Committee opinion may be or the collective point of view of the Club.

Because our bylaws mention the "cultivation of mountain craft" and the "encouragement of mountain climbing and exploration," I feel that we are well within the objectives of the Club in taking more active part in conservation measures and that it is in the Club's best interests to do so. I also feel that while we must not lose our tax-free status, at the same time we cannot shirk a national responsibility through unwillingness to expose ourselves to some possible risk. In this connection we have a very capable group of lawyers in the Club who can decide for us the risk which any proposed move might incur. Finally, I believe that the growing irresponsibility in this country toward our recreational resources demands positive action from all such organizations as our own. It would be a narrow and selfish

view for the present membership not to take steps to preserve for future generations and our future Club members some of those areas of unspoiled mountain wilderness which we have inherited and deeply appreciated, areas which have provided experiences that have enriched our lives and renewed our spiritual outlook.

In attempting to provide a basis for action I recommend the following functions for the Conservation Committee, subject to Committee and Council approval:

Proposed preamble:

The Committee will direct its efforts as follows—

1. It will keep the Club membership informed of conservation measures which affect North American mountain country and will attempt to discover in what ways the Club as an organization, or through its individual members, may be useful in promoting these measures if judged worthy of support by the Club.

2. The *American Alpine Club News* and the *Journal* will be used as means of conveying information on conservation. The *News* is the best vehicle for giving up-to-date data on current status of conservation issues. The *AAJ* may provide opportunity, from time to time, for an appropriate article based on authoritative information.

3. The Club members should be encouraged at regular intervals through the *News* to forward information affecting conservation measures interesting the Club.

4. Committee should encourage Club members to support conservation measures individually and as citizens speaking for themselves. On the other hand, Committee should discourage use of the Club's name in the attempt by an individual member to promote a conservation measure, regardless how worthy it may be.

5. Conservation measures of national scope and importance should be studied carefully by the Committee, with the assistance of capable lawyers in our membership, and consideration given to the use of the Club's name as an organization. If it is thought that the Club's support will be effective in making the measure successful, the Club's name will be used to that purpose.

6. Committee should recommend membership of the Club in organizations of National scope which are found to be promoting conservation measures in accord with the Club's vital interest in the preservation of high-mountain wilderness areas. An example of such an organization might be the Natural Resources Council of America, a national forum of 37 organizations banded together to coordinate their information facilities

and to achieve mutual support. In its nine years the Council of this organization has achieved a great deal in the field of conservation and has won the respect of the Federal Government. Through such membership much accurate material assessing the needs of conservation may reach your Committee and the rest of the membership.

7. The Committee should prevent the Club as an organization from becoming involved in local conservation problems which fall naturally within the interest and authority of regional or local mountain clubs unless the problem is found to affect the interests of a majority of the Club's members on virtually a national scale.

December 1, 1956.

WILLIAM S. CHILDS, *Chairman*

CLUB PUBLICATIONS

THE AMERICAN ALPINE JOURNAL, annually from 1929, illustrated. Price and availability upon request. Current issue, $3

A CLIMBER'S GUIDE TO THE ROCKY MOUNTAINS OF CANADA, by Howard Palmer and J. Monroe Thorington, revised edition by Thorington, 1953. This guide covers all peaks of interest to climbers with routes and map references. $4 ($3 to members)

A CLIMBER'S GUIDE TO THE INTERIOR RANGES OF BRITISH COLUMBIA, by J. Monroe Thorington. Covers the Selkirk, Purcell (including Bugaboos), Monashee, and Cariboo ranges. Third Edition, 1955, $3 ($2.50 to members)

A CLIMBER'S GUIDE TO THE CASCADE AND OLYMPIC MOUNTAINS OF WASHINGTON, by Fred Beckey. Contains 1,000 routes on 500 peaks, with photographs, maps, and index. $4 ($3 to members) Supplement on new routes available separately, 50 cents

A SURVEY OF EARLY AMERICAN ASCENTS IN THE ALPS IN THE NINETEENTH CENTURY, by J. Monroe Thorington. Illustrated. $2 ($1.50 to members)

WHERE THE CLOUDS CAN GO: THE AUTOBIOGRAPHY OF CONRAD KAIN, edited by J. Monroe Thorington. A reprint (1954) of the book originally published by the club in 1935. $5

ACCIDENTS IN AMERICAN MOUNTAINEERING. Annual report of the Safety Committee of the American Alpine Club. 25 cents

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